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President's Report

FOR THE YEAR ENDING
30TH JUNE, 1938

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PRESIDENT'S REPORT

1937-1938

To the Governors of the University of Toronto:

GENTLEMEN:

I have the honour to present herewith my report on the academic work of the University and University College for the twelve months ending on the 30th June, 1938:

INTRODUCTION

The year's academic work has been marked by co-operation among the staff, thorough and stimulating teaching, much publication of the results of investigations, the carrying on of innumerable researches, and in the main, serious and successful work by the students. This university has attained among educational institutions a high reputation for scholarship, teaching and research. That reputation can be maintained only by retaining and securing instructors and investigators of the highest rank. On the teaching staff the real importance and worth of a university depends. The university still stands in the front rank of those agencies of society which are engaged in "the task of putting intelligence, rationality and spirituality into living."

The detailed reports of the different faculties and departments of the University are appended and deserve careful attention. In my commentary on the work of the year, I can give only supplemental information and a summary treatment of special features.

Owing to the epidemic of poliomyelitis the University opened one week later than normal. Lectures began on October 6th.

There has been a slight diminution in the registration, mainly in the Faculties of Arts and Medicine. If we look over the registration for the last few years, we shall find relatively slight variations from year to year. This probably means that there is no need in our country at the moment for a larger annual supply of graduates in the professional schools. So far as a general arts education is concerned, the life of the individual is enriched by it; he ought to be reasonably equipped with that combination of knowledge, discrimination, and sound judgment which universities seek to provide. In that case, no country can have too many men and women so trained and disciplined, no matter in what field of national life they may be found.

The hall-mark of a university is and always should be quality rather than quantity; the chief aim should be to improve the quality of work rather than merely increase the number of students, "intensification of effort rather than extension of enrolment".

ATTENDANCE

The total number of students enrolled was 7,841, of whom 4,889 were men and 2,952 women; 7,232 being registered in the colleges and faculties, and 628 in the departments. The number of students proceeding to degrees was 6,374 and to diplomas 813. Of the students in attendance 3,786 came from Toronto, and 3,251 from other parts of the Province of Ontario. Every county is represented. There has been a decrease in registration of 295.

THE STAFF

The total staff of the University and University College numbered 914, of whom 119 were professors, 77 associate professors, 93 assistant professors, 226 lecturers, associates (in medicine and dentistry) and instructors in the Ontario College of Education, 1 director, 2 assistant directors, 396 demonstrators, fellows and instructors with sessional appointments.

In the Federated Colleges there are 117.

The total number in the complete staff is 1031.

During the year we have suffered the loss of members of the staff in the past and present. The list is as follows:

Adam Carruthers, M.A., professor emeritus, faculty of arts; G. R. Pirie, M.B., F.R.C.P. (London), associate in paediatrics, faculty of medicine; C. A. Kennedy, D.D.S., associate professor, faculty of dentistry.

On Nov. 12, 1937, Professor Emeritus Adam Carruthers passed away in his 81st year. He was one of the few remaining links with the University of earlier days. Of Scottish birth and Canadian training he graduated, through University College, as gold medallist in classics in 1880, and was one of the best pupils of Dr. McCaul. After qualifying as a barrister he was drawn back to the study and teaching of Greek and Latin. He taught at Seaforth and Parkdale, and then began his long connection with the staff of University College. In 1893 he was appointed lecturer in Greek, associate professor in 1908, and in 1918 professor. Here he taught his classes faithfully and quietly till his retirement in 1923. He possessed and required a thorough knowledge of the grammar and syntax of Greek and Latin as a basis for appreciation of their literature and their legacy to modern times. With Professor J. C. Robertson of Victoria College he was the joint author of various Latin grammars and readers, some of which have been used in our secondary schools for the past forty-five years. He carefully studied the influence of classical authors on English poets, especially on Tennyson. He may be said to have laid the foundations of a department of classical archaeology in our University. His three sons are graduates of this University; one of them is on the classical staff at McGill. A retiring, studious teacher, of fine character, he left a deep impression for good on the successive groups of undergraduates who attended his classes.

On May 5, 1938, died Dr. George R. Pirie, associate in paediatrics, at the age of 58. He graduated in Medicine from this University in 1901, did postgraduate work in New York and practised in Calgary. In 1913 he again went abroad, this time to London, for further experience and study. While in England he was head of the Great Ormond Street Hospital for Sick Children and received his licentiate of the Royal College of Surgeons and his membership in the Royal College of Physicians. Later, after his return to Canada, he received his fellowship in the Royal College of Physicians. He served on the staff of the Hospital for Sick Children, Toronto, and in the department of paediatrics in this University. A good teacher and skilful physician he was held in high esteem by his colleagues, his students and his patients.

Dr. C. Angus Kennedy of the Faculty of Dentistry died suddenly during the summer vacation of 1937 in his sixty-third year. A graduate of the Royal College of Dental Surgeons, he served for years as associate professor of orthodontia in the Faculty of Dentistry and was librarian of the Faculty. The high esteem in which he was held by the members of his profession is shown by his election to be President of the Ontario Dental Association and a member of the Board of Directors of the Royal College of Dental Surgeons of Ontario. A tablet to his memory has been erected in the faculty building by the profession of dentistry in the Province, and is inscribed in honour of one who was to students and colleagues "teacher, librarian and friend". The Library is his abiding monument.

Under the age limit Herbert Austin Fricker retired from the Faculty of Music. After being organist for the City of Leeds, England, from 1898 to 1917, organist and chorus master of the Leeds Musical Festival and conductor of the Leeds Philharmonic Society and of the Leeds Symphony Orchestra, he came to Canada in 1917. He was a Master of Arts of Leeds University, a Bachelor of Music of Durham, an honorary Doctor of Music of Toronto, and a Fellow of the Royal College of Organists. Ever since his arrival in Canada he has been organist and choir master of the Metropolitan Church, Toronto, and conductor of the Famous Mendelssohn Choir founded by Dr. A. S. Vogt. On the establishment of a faculty of music in this University in 1918, Dr. Fricker became a member of the staff, lecturing on choral and orchestral work. A competent and kindly teacher, he added distinction to the Faculty of Music.

The following resigned their positions:

W. C. Ferguson, B.A., professor of methods in modern languages, Ontario College of Education; Miss I. M. Biss, M.A. (Bryn Mawr, Camb.), assistant professor political economy; T. C. Graham, B.A.Sc., lecturer, mechanical engineering; Miss E. M. Stuart, lecturer, School of Nursing; Miss H. Stantial, S.B. (Simmons), M.A., Ph.D., lecturer, chemistry; V. Lange, M.A. (Tor.), Ph.D. (Leipzig), lecturer in German; J. A. Kinnear, M.D., C.M., associate in obstetrics and gynaecology.

At the end of August 1937 Professor William Chalmers Ferguson retired from the staff of the Ontario College of Education after nearly half a century of service in the schools of Ontario. Graduating from this University in 1889 he taught successively in Uxbridge, St. Mary's, London and Riverdale, Toronto. In 1910 he returned to his *alma mater* as lecturer in methods of teaching modern languages in the faculty of education, and chief instructor in French and German in the University Schools. His success in training teachers led to a full professorship of methods in modern languages, to membership in the Senate of the University, and in various educational commissions. In 1935 he was appointed chairman of the committee on text-books for provincial schools in which French is a language of instruction. He has exercised a fine influence on the modern language teachers of the Province, combining enthusiasm, scholarship and practical power of instructing.

Miss Irene Mary Biss resigned at the end of the year to be married and take up residence in England. A graduate of Cambridge University she came as a lecturer to Bryn Mawr College and in 1929 was appointed a lecturer in political economy in the University of Toronto. She was promoted to be an assistant professor in 1934. She was an excellent teacher, combining research with instruction. During the summer vacations she travelled over Canada investigating the economic aspects of various industries, notably of the pulp and paper industry.

Dr. James Alexander Kinnear, has been a demonstrator in obstetrics and gynaecology from 1907-8 to 1913-14, and an associate since 1914. After long and efficient service he has resigned and taken up practice in Timmins in Northern Ontario.

These and junior members of the staff who have gone to other positions deserve our heartfelt thanks for their services. Some who have been with us for years have given to the university and its students the full measure of their energies and abilities.

Leave of absence was granted to:

For the session: F. A. Mouré, Mus. Doc., bursar; D. C. MacGregor, B.A., assistant professor, political economy; G. A. Cline, M.A., instructor in University Schools.

For one term: W. H. Martin, M.A., Ph.D., F.R.S.C., associate professor chemistry; E. A. Dale, M.A. (Ox), professor, Latin; A. Brady, B.A. (Ox), M.A.,

Ph.D., associate professor, political economy; T. M. C. Taylor, B.A. (B.C.), M.S. (Wisc), Ph.D., assistant professor, botany; R. D. C. Finch, B.A., assistant professor, French; Miss H. L. Bryans, B.A., instructor in physical education, Ontario College of Education.

The following new appointments and promotions were made during the year:

In the Faculty of Arts:—Appointments: E. S. Moore, M.A., Ph.D. (Chic), F.R.S.C., head of the department of geology; F. B. Kenrick, M.A., Ph.D. (Leip), F.R.S.C., head of the department of chemistry; H. A. Innis, M.A. (McM), Ph.D. (Chic), F.R.S.C., head of the department of political economy; G. B. Langford, B.A.Sc., Ph.D. (Corn), professor of mining geology; M. A. Peacock, M.A. (Harv), Ph.D., D.Sc. (Glas), associate professor mineralogy; R. M. Dawson, M.A. (Dal), A.M. (Harv), M.Sc., D.Sc. (Lond), associate professor political economy; E. K. Brown, B.A., D. es L. (Paris), associate professor English; L. S. Russell, B.Sc. (Alberta), M.A., Ph.D. (Princ), assistant professor palaeontology; K. C. Fisher, B.A. (Ac), M.A., Ph.D., assistant professor experimental biology; C. D. Rouillard, A.B. (Bowdoin), M.A., Ph.D. (Harv), assistant professor French; G. F. Wright, B.S., Ph.D. (Iowa), special lecturer chemistry; J. J. Rae, B.A. (McM), M.A., Ph.D., special lecturer chemistry; F. J. Westcott, B.A. (Brandon), special lecturer political economy; D. B. DeLury, M.A., Ph.D., lecturer mathematics; V. B. Meen, M.A., Ph.D., lecturer in mineralogy; P. Nash, A.B. (Wisc), Ph.D. (Chic), lecturer, anthropology.

Promotions: J. T. Burt-Gerrans, Phm.B., M.A., Ph.D., from an associate-professorship to a professorship in chemistry; L. J. Rogers, B.A.Sc., M.A., from an associate-professorship to a professorship in chemistry; D. S. Ainslie, M.A., Ph.D., from an assistant-professorship to an associate-professorship in physics; H. J. C. Ireton, M.A., Ph.D., from an assistant-professorship to an associate-professorship in physics; G. deT. Glazebrook, B.A., M.A. (Ox), from an assistant-professorship to an associate-professorship in history; J. O. Wilhelm, B.Sc. (Sask) M.A., from a lectureship to an assistant-professorship in physics; M. F. Crawford, B.A. (West), M.A., Ph.D., from a lectureship to an assistant-professorship in physics; A. Pitt, B.A. (Houghton), from a lectureship to an assistant-professorship in physics; Miss M. A. Fritz, B.A. (McG), M.A., Ph.D., from a lectureship to an assistant-professorship in palaeontology; D. C. MacGregor, B.A., from a lectureship to an assistant-professorship in political economy; A. F. W. Plumptre, B.A., M.A. (Camb), from a lectureship to an assistant-professorship in political economy; K. S. Bernhardt, M.A., Ph.D. (Chic), from a lectureship to an assistant-professorship in psychology; C. R. Myers, M.A., Ph.D., from a lectureship to an assistant-professorship in psychology; J. R. MacGillivray, M.A., Ph.D. (Harv), from a lectureship to an assistant-professorship in English; H. Boeschenstein, Ph.D. (Rostock), from a lectureship to an assistant-professorship in German.

In the Faculty of Medicine:—Appointments: W. Boyd, M.D. (Edin), F.R.C.P., professor, pathology and bacteriology; W. W. Jones, B.A., M.B., honorary professor, surgery; C. G. Smith, M.Sc. (West), M.D., Ph.D., lecturer, anatomy; Miss M. I. Tom, B.A., M.B., lecturer, pathology and bacteriology; K. G. Gray, M.B., B.Sc. (Med), lecturer, medical jurisprudence; W. L. Robinson, B.A. (McM), M.B., F.R.C.P. (C), lecturer, medical jurisprudence; B. Hannah, M.B., F.R.C.P. (C), associate, medicine and clinical medicine; J. Hepburn, M.B., F.R.C.P. (C), associate, medicine and clinical medicine; T. Owen, M.B., M.R.C.P. (Lond), F.R.C.P. (C), associate, medicine and clinical medicine; T. A. Robinson, M.D.C.M. (McG), associate in surgery and clinical surgery; J. W. Ross, M.B., M.S. (Minn), associate in surgery and clinical surgery.

Promotions:—A. W. Ham, M.B., from an assistant-professorship to an associate-professorship in anatomy; G. L. Duff, M.A., M.D., Ph.D., from a lectureship to an assistant-professorship in pathology and bacteriology; K. G.

McKenzie, M.B., F.R.C.S. (C), from an associateship to an assistant-professorship in surgery.

In the Faculty of Applied Science:—Appointments: S. E. Wolfe, M.A.Sc., lecturer in mining engineering; H. Carver, special lecturer, town planning.

Promotions:—C. F. Morrison, B.E. (Sask), M.Sc. (McG), from a lectureship to an assistant-professorship in civil engineering; W. L. Sagar, B.A.Sc., C.E., from a lectureship to an assistant-professorship in civil engineering.

In the Faculty of Dentistry:—Appointments:—L. A. Kilburn, D.D.S., associate professor, dental praxis; W. D. Cavanagh, D.D.S., lecturer, dentistry; C. V. Fisk, D.D.S., associate, dentistry; J. Kreutzer, D.D.S., B.Sc.(Dent), associate, dentistry; F. Martin, D.D.S., associate, dentistry; G. W. Spinks, D.D.S., associate, dentistry; R. L. Twible, D.D.S., B.Sc.(Dent), associate, dentistry.

In the Department of Social Science:—Promotion:—A. E. Grauer, B.A. (B.C. Ox.) Ph.D. (Cal), from an associate-professorship to a professorship and directorship.

In the Ontario College of Education: Appointments:—Miss H. B. St. John, B.A., assistant professor of modern languages; A. T. McLachlan, lecturer in shopwork and instructor in University Schools; H. McGuire, B.A. (Qu), B.Paed., instructor in University Schools.

Promotion:—B. C. Diltz, M.A. (Qu), from an assistant-professorship to an associate-professorship of methods in English and history.

Medical Research—Banting:—Promotion:—C. C. Lucas, M.A.Sc. (B.C.), Ph.D., from an assistant-professorship to an associate-professorship.

Honours were conferred upon members of the staff:

Dr. William Boyd, professor of pathology and bacteriology, was invited to give three lectures under the Porter Lectureship in Medicine at the University of Kansas; Professor E. F. Burton, professor of physics, was invited to give lectures on "Low Temperature" at the Bell Telephone Laboratories, New York, at Cornell University, at the University of Rochester, and at the Massachusetts Institute of Technology; Dr. W. E. Gallie, Dean of the Faculty of Medicine, was invited to give the Founders' Lecture in Vancouver to the North Pacific Surgical Society, and the Mayo Foundation lecture; Professor T. J. Meek, department of Semitics, was elected president of the Mid-West Section of the Society of Biblical Literature, and an honorary member of the Eugene Field Society; Professor E. K. Brown, department of English, was visiting professor of English at the University of Minnesota; Professor Griffith Taylor, department of geography, has been appointed joint editor of the "International Zeitschrift für Rassenkinde" (Stuttgart), contributing editor of "Economic Geography" (Worcester, Mass), director, American Polar Society (New York), and President (Section E) British Association for the Advancement of Science at Cambridge, England; Sir Ernest MacMillan, Dean, Faculty of Music, was guest conductor of the Philadelphia Orchestra, of the National Symphony Orchestra at Washington, D.C., of the Ford Sunday Evening Hour in Detroit for five concerts, and for one of the series of Les Concerts Symphoniques in Montreal; Professor C. H. Best, professor of physiology, was elected a Fellow of the Royal Society of England; Dr. Gordon Murray, department of surgery, has been appointed Hunterian Professor in the Royal College of Surgeons of England for his work on "Heparin"; Professor Homer A. Thompson, department of classical archaeology, was elected Vice-President of the Archaeological Institute of America, and lectured in the Universities of Oxford, Cambridge and London on "Excavations in the Agora"; Dr. J. G. Fitzgerald, professor of hygiene and preventive medicine, was elected a Vice-President of the International Association of Microbiologists.

The University owes much to Herbert Edward Terrick Haultain, C.E., who has been associate professor since 1908, and professor, since 1910, of mining engineering in the Faculty of Applied Science. Graduating from Toronto, he

took further work at the famous mining academy in Freiberg in Saxony. He has had experience as a mining engineer in Ireland, Bohemia, South Africa, British Columbia, the Western United States and Canada. He was held in high esteem by the mining leaders of Northern Ontario and from them obtained for his department assistance in money and equipment. In 1925 he was elected President of the Association of Professional Engineers of Ontario. He was among the founders of the Technical Service Council, established to place graduates of our technical training institutions in Canadian industry. He was awarded in 1937 the Randolph Bruce Gold Medal in recognition of his research work in mining engineering. He retired at the end of this academic year in order to pursue certain investigations in his own field for which his heavy teaching duties did not allow him the necessary time. In grateful acknowledgment of his distinguished services to the University and the mining industry of Canada, he was made a professor emeritus. He will carry on his researches in the Mill building, which was erected during his term of office by the Ontario Department of Mines to provide the additional accommodation needed for his steadily growing department. A vigorous and stimulating personality, he has won the respect of his students and of the whole mining community.

NEW APPOINTMENTS FOR 1938-39

In the Faculty of Arts the following major appointments have been made for the coming year:

T. A. Goudge has been made a lecturer in philosophy. A graduate of Dalhousie University he held an open fellowship in Toronto in 1934-5, and the Royal Society Fellowship held at Harvard in 1936-7. He taught at Queen's University in 1935-6, and in 1937-8 took the work of Professor Vlastos of Queen's during his year of absence.

Miss J. C. Romeyn graduated with first class honours in chemistry and took special work in micro-analysis in the University of the City of New York. She succeeds Miss Stantial as lecturer in micro-analysis in the department of chemistry.

We have been very fortunate in securing for a lectureship in applied mathematics Dr. Leopold Infeld. Born in Poland, he received his doctor's degree at the University of Cracow in 1921. He collaborated in research work with the eminent mathematicians, or theoretical physicists, Drs. Born and Einstein. He has been joint author with the latter of "The History of Relativity", and has issued other publications in his special field of research. He is warmly recommended to us by Professor Einstein and Professor H. P. Robertson of Princeton University.

The department of geography has grown so rapidly that, in view of a fresh group of students in the first year, it has been necessary to secure a full-time lecturer. After long searching, it was decided to appoint Dr. Stephen B. Jones, Bachelor of Science of the University of Washington; Master of Arts of Harvard in 1929, and Ph.D. of Harvard 1934. At Harvard he took courses in geology, geography, mineralogy, palaeontology and meteorology. After teaching experience in Harvard, Kansas State University and Lehigh University, he was appointed to the department of geography in the University of Hawaii. He has travelled widely and published valuable papers in the *Geographical Review*. His coming will relieve the already over-burdened but ever-enthusiastic head of the department, Professor Griffith Taylor.

In succession to Mr. Victor Lange, who resigned his lectureship in German to accept a position on the staff of Cornell University, Dr. Martin Joos of the University of Wisconsin has been appointed. He is of Swiss-German stock. He has specialised on the philological side of German and strengthens the department in teaching the history of the language.

To the department of political economy, Dr. Harold Amos Logan brings special authority on problems of labour and industrial relations. A graduate of

Acadia University, he took postgraduate work at Yale and Chicago. He has taught in Purdue University, Brandon College, Randolph Macon College, and the University of Western Ontario as professor of economics and political science. He comes to us as associate professor of political economy. He served in the Great War in the Artillery and with the Army of Occupation on the Rhine. He has written "The History of Trade Union Organisation in Canada" (1928) and "Labour Costs and Standards" in the volume on "Labour" in the series on "Canadian American Relations" (1937), as well as articles in various economic journals. He will strengthen our economics department in the important field of labour questions.

For some years we have sought to find a suitable professor of mediaeval history. For the coming year we have appointed Dr. B. Wilkinson of the University of Manchester, England, a pupil of the well-known mediaevalist, Professor James Tout. Professor Wilkinson took his M.A. and Ph.D. at Manchester, his undergraduate career was interrupted by three years of army service 1916-19. From 1923 to 1930, he was lecturer in history in University College, Exeter; and from 1930-8 lecturer in constitutional history in Manchester University. He has written much on the mediaeval period—including volumes entitled "The Chancery under Edward III" (1929), "The Mediaeval Council of Exeter" (1931), and "Studies in Constitutional History" (1937), and contributions to the English *Historical Review*, *History*, the *Law Quarterly Review*, and other historical journals. Through the Institute of Mediaeval Studies at St. Michael's and the special equipment of Dr. Wilkinson in the constitutional history of mediaeval England, this University should continue to make valuable contributions to the interpretation of the Middle Ages in relation to present day problems.

In the Faculty of Medicine Dr. J. K. W. Ferguson has been appointed assistant professor of pharmacology under Professor V. E. Henderson. He graduated from this University in arts in 1928 and in medicine in 1932. After serving as interne in the Toronto General Hospital, he went to the University of Cambridge as a research scholar, working with Professor F. J. W. Roughton (who deals with the physico-chemical aspects of physiology). He returned to be assistant in physiology at the University of Western Ontario, and after two years was appointed to the department of physiology in the State University of Ohio at Columbus. He has shown a steady development in the breadth of his interests and in his knowledge of techniques. He has been a successful teacher in Ohio, and will doubtless prove equally influential in our department of pharmacology.

In the Faculty of Engineering important appointments have been made for the next academic year:

Charles G. Williams has been appointed to the professorship of mining engineering in succession to Professor H. E. T. Haultain. This appointment has met with universal approval from our own mining graduates and from the mining men in Northern Ontario. Professor Williams graduated from the School of Practical Science in 1903, having spent summers in the machine shop and practical milling work of the Canadian Corundum Company, and in land surveying in Saskatchewan. In 1904 he was a fellow in chemistry in this University with summer work underground in Calumet and Hecla Mine, Michigan. In 1905 he won the degree of B.A.Sc. with honours from the University of Toronto. His engineering experience has been wide and various. In the pulp and paper industry he has been chemist and superintendent; he has prospected in our north country; he has held positions of responsibility in connection with the Buffalo Mine, Cobalt; the Otisse Mine, Elk Lake, and the Nova Scotia Mine, Cobalt; he has been general manager of the Deister Machine Company, Fort Wayne, for the making of concentrating machinery; and from 1913 to 1928 he has been associated with the Hollinger Consolidated Gold Mines—serving as the general superintendent for twelve years. On retiring from the Hollinger he has

been a consulting mining engineer in Toronto. The esteem in which his colleagues hold him is shown by his election to the presidency of the Professional Engineers of Ontario, the vice-presidency of the Canadian Institute of Mining and Metallurgy, and the presidency of the Toronto Branch of the Institute. In Professor Williams we believe we have found one who combines scientific knowledge with practical experience and who will transmit to students the stimulus of his own enthusiasm. He will keep his department in close touch with the mining development of our Northland.

Robert Ferguson Legget has been appointed assistant professor of civil engineering. He was trained in the University of Liverpool, receiving the degrees of Bachelor and Master of Engineering. He had a broad experience on the staff of the famous firm of consulting civil engineers, S. Meik and Buchanan of London, England. He prepared contract documents for hydro-electric schemes in Scotland, Greece, Italy and Finland, and was engaged on dock, harbour and general civil engineering work. As assistant to the chief resident engineer, he was associated with the construction of the Lochaber Water Power works in Scotland. From 1929 to 1932 he was employed as engineer with the Power Corporation of London and as resident engineer and assistant to the construction superintendent of the Upper Notch Water Power plant (probably the largest automatic plant in Canada); from 1932-6 he was engineer for the Canadian Sheet Piling Company.

In 1928 he was awarded the James Forrest medal and the Joule medal of the Institution of Civil Engineers, and later on the Society's Premium and the Telford Premium of the same institution. For the last two years he has been in the engineering department of Queen's University, Kingston. He is a brilliant young engineer; and, by reason of his English training and varied achievements in the world of construction, he will make a fine contribution to the teaching strength of our Faculty of Applied Science.

Robert B. McIntyre comes as lecturer in applied mechanics to aid Professor T. R. Loudon in his many duties. In 1936 he graduated from this university as B.A.Sc. in mechanical engineering. Awarded a Massey fellowship he proceeded to the University of Cambridge (St. John's College) when he studied aeronautical engineering under the Mond professor of this subject, B. Melvill Jones, learning British methods and technique, especially on the side of research and development. In the vacations he has worked in the Royal Aircraft establishment in Farnborough. He will be of special value to members of the projected course in aeronautics.

Until this year we have not been able to secure a suitable person to take the work carried on by Dr. T. R. Rosebrugh, the former head of electrical engineering. Now we are glad to appoint to an associate-professorship Gordon F. Tracy (a son of Emeritus-Professor F. Tracy of the department of ethics in University College).

Mr. Tracy's undergraduate course in Toronto was broken by three years of Overseas Service in the Great War. In 1921 he graduated with honours in electrical engineering. He remained here for three years as research assistant to Professor H. W. Price. He went to the Massachusetts Institute of Technology and obtained his Master of Science degree, by work mainly on the theory of electrical machinery and circuits. He was appointed to the staff of the University of Wisconsin and has served there from 1926 to 1938, as teacher, superviser of laboratories and director of graduate students in electrical engineering. Out of this work grew two publications accepted by the American Institute of Electrical Engineers—"Power Transients in A.C. Motors" and "Split Phase starting of 3-Phase Motors" (a thorough study of the performance of such motors in unbalanced conditions of electrical supply). During the past five years he has been employed during the summers in the A.C. Design Department of the Allis-Chalmers Mfg. Co. of Milwaukee, in developing new methods of predicting by calculation the performance of large synchronous motors during both running and starting conditions. In Professor Tracy we feel we shall have a thoroughly competent instructor, both in electrical theory and application.

In the Faculty of Music, Dr. Healey Willan and Mr. Leo Smith have been appointed professors. Both have been lecturers in this faculty for some years. Dr. Willan is a skilled organist and choir leader and a composer of world-wide fame. Mr. Leo Smith is the first cellist in the Toronto Symphony Orchestra and a noted composer of chamber music.

In the Library School, Miss M. E. Silverthorn has been appointed an assistant professor. A graduate of the University of Alberta, she served two years in the Public Library of Calgary, and then went to the University of Illinois where she received the degree of Bachelor of Library Science. After seven years of work in large public libraries in the State of Michigan she was appointed assistant professor of library science in the Carnegie Library School at Pittsburgh, from which she will come to us. She will bring to the work of our Library School the best experience and teaching power of the first class libraries and library schools of the United States.

THE UNIVERSITY IN GENERAL

Under authority of the University Act, the Senate with the approval of the Board of Governors made some additions to its membership in order that all groups of graduates might be adequately represented. Medicine will be represented by three additional elected graduates, engineering by two, dentistry by two, agriculture by one; while household science, education, and veterinary science will have one each, and pharmacy two—these four groups being previously unrepresented; the department of university extension will be represented by the director for the time being; the department of social science and the school of nursing will be represented by one member appointed by their Councils. By these changes I believe all groups of graduates will be fairly represented on the Senate.

New buildings on the west side of St. George Street have been purchased, which provide accommodation for psychology and for the Workers' Educational Association. Owing to the large number of students who take psychology in nearly all faculties it had become necessary to secure additional space for experimental and practical work. Additional space has been granted to the Canadian Medical Association to house the secretary of the allied Associations for Cancer Control.

The agreement with the Ontario College of Pharmacy for providing instruction in certain subjects has been extended for two years. In all probability the pharmacy authorities will raise the standard of admission to conform with the general university requirements, and will lengthen the course. It has been agreed for the present that a degree in pharmacy will not be an indispensable condition for licensing to practice. The question of degree or degrees will be dealt with later.

Dr. F. A. Mouré, the bursar, who has been connected with the University for nearly half a century, was absent on leave during the session. During his absence Mr. Charles Higginbottom, the assistant bursar, efficiently discharged the duties in a year which unexpectedly called for much extra time and work.

One of the outstanding events of the year was the special Convocation held on October 22nd 1937 to confer an honorary degree on the Hon. Cordell Hull, Secretary of State for the United States. Lord Tweedsmuir, his host in Ottawa, accompanied him to Toronto, as did also the Rt. Hon. Mackenzie King, the Prime Minister of Canada, and the American Minister to Canada, Mr. Armour. The occasion was historic. Mr. Hull's comprehensive address on the reign of law as against the reign of force was published in all the leading newspapers of the Continent.

The University and the Royal Ontario Museum made a striking display at the Canadian National Exhibition. An actual demonstration was given of the method by which the skeleton of a dinosaur is separated by patient chiselling from the encrustations which surround it. The vivarium or collection of living

creatures from the museum of biology drew great crowds. To Mr. Dunlop, the Director of University Publicity, we owe this successful effort to link up the work of the University with the general life of the Province.

A large delegation of College Presidents and Trustees and business men from the State of Georgia visited this University last May, under the guidance of Dr. Jackson Davis, associate director for Southern Education of the General Education Board of the Rockefeller Foundation. They represented various neighboring institutions in and around the City of Atlanta, such as Emory University and Agnes Scott College, and came to investigate the practical working of the system of college federation established here by the Act of 1887. We showed them all we could and they seemed happy in their visit.

Among visitors to the University who have gone over our buildings, even though they have not given lectures, are the following: Lord Eustace Percy (formerly President of the Board of Education, Great Britain, and new Rector of King's College, Newcastle, in the University of Durham), Archbishop Day of Armagh, Dr. T. R. Glover (Public Orator of the University of Cambridge), Rt. Hon. Lord Queenborough, the Lord Bishop of Leicester, England, Baron Silvercruys (the Belgian Minister to Canada), Prof. Kaye of the National Physics Laboratory of London, Dean Landis of the Harvard Law School, Viscount Cecil of Chelwood (awarded the Nobel Peace Prize in 1937), Dr. Brüning (former Chancellor of Germany), Lord Hewart (the Lord Chief Justice of England), Rev. Dr. Henry Sloan Coffin (President of Union Theological College, New York), Dr. John A. Mackay (President of Princeton Theological Seminary)' President Valentine (of Rochester University), Count Robert de Dampierre (French Minister to Canada), Dr. Liu (President of Che-loo University, Tsinan, China), and Hon. Angus Macdonald (Premier of Nova Scotia).

Mr. W. B. Brander, Secretary of the Bureau of the Universities of the Empire, established in London, paid a visit to Canadian universities and to our University, among others. His observations bore on the contents of the *Universities Year Book* issued by the Bureau. This Bureau is a clearing-house of information on all phases of higher education.

FACULTY OF ARTS

Dr. Henry B. Ward, emeritus professor of biology of the University of Illinois, the most distinguished limnologist of North America, and a past president of the American Association for the Advancement of Science recently visited the Fisheries Research Laboratory in Northern Ontario, which is carried on in connection with our department of biology. The credit for the success of this laboratory should go to Dr. Clemens (now director of the Pacific Biological Station) who organised it and Professor Harkness of our own biological staff who now directs it. Dr. Ward writes to Professor E. M. Walker head of the department of biology:

> "I want to congratulate you on the splendid work which is being done by the Fisheries Research Laboratory. I came expecting to spend four or five days, but the work was so interesting and the contact with Professor Harkness so appealing that I allowed his blandishments to persuade me and spent as many weeks with him. He has the best co-ordinated program for freshwater biology that I know of and he is getting fundamental results that far surpass those obtained by people who work on their own problems without any regard for what the other fellow is doing. I have always felt that the profitable attack on biological problems would be made in the future through co-operating investigators, and this seems to show it. I hope that that work may have the support it deserves. If then it can be effectively applied by the people in Ontario and in Canada who control the fisheries service, I am sure you will find a return far exceeding the outcome of our previous and disjointed attacks on the problem where everybody seemed to

be going his own way and little attention was given to the real significance of even those results which were secured by investigators."

This is indeed high praise from the highest authority.

Professor Homer Thompson spends one half of the year with us in Toronto and the other half in Athens, where he is actively engaged in excavation work carried on under the American School.

During the spring he took an active part as assistant director in the eighth annual campaign in the excavation of the ancient Agora at Athens. The work of laying bare the Market Square itself, the public buildings, sanctuaries and private houses that surround it, is now nearing completion; though several more years will be required for the detailed investigation of the principal buildings. The activities of the past season included the exploration of the Klepsydra, the spring on the shoulder of the Acropolis which is repeatedly referred to by Greek authors; of the Eleusinion or sanctuary of Demeter and Kore, one of the most venerable in Athens; and of the roadway by which the Panathenaic Procession made its way from the lower city to deliver her new robe to Athena in the Parthenon. As in previous years much sculpture has been found, coins, inscriptions and pottery dating from the Neolithic period through the Middle Ages. Professor Thompson spent most of the season in completing the exploration around the Council House and the adjacent Tholos which served as the office and club-house of the Councillors. It has been possible to recover the history of these buildings from their first beginnings in the time of Solon in the early years of the sixth century B.C. to their final abandonment in the sixth century of our era. The results are of interest not only for Athens, but for Greece at large. In no other city of Greece has it been possible to trace the history of the public buildings in such detail or to so early a beginning. The publication dealing with this group of buildings should be ready next summer.

During the summer Professor Thompson spent some time in preparing the publication of the results of excavations carried out under his direction during the previous several summers on the Pnyx Hills. The material includes almost a mile of the city walls of Athens, not previously explored, much pottery, terra-cotta figurines and other small finds. In this work he enlisted the co-operation of several members of the American School of Classical Studies.

Two of our graduates in classics and archaeology, Carl Roebuck of University College and W. A. McDonald of Victoria College, have gone to Athens this year and are taking part in the excavations. Roebuck has a fellowship from the University of Chicago and McDonald one from the Royal Society of Canada.

I feel that our students in classical archaeology enjoy a rare privilege in receiving tuition from one who is in constant touch with the actual work of excavation and to whom the storied land of Greece is as familiar as his homeland.

Sociology is being gradually separated from anthropology and will probably become an independent department under Professor C. W. Hart.

For the first time, the department of anthropology has been able to send out an expedition to excavate an ancient Indian site in this Province. Dr. Nash, who has had much experience of excavation among the Mississippi Valley Mounds, conducted a small group from the Museum to a property near Aylmer, which proved to be the site of a prehistoric village. The details of the discoveries made will appear in next year's report, suffice it to say that the remains of a house-structure of the Iroquois "long-house" type have been found, and 3000 specimens have been recovered from a pile of refuse, which when carefully studied will enable archaeologists to reconstruct a picture of life in a prehistoric Canadian village.

This year the Department of Political Economy completed fifty years of teaching and research. In 1888-9 Professor Wm. J. (later Sir William) Ashley delivered the first lectures in the new department of political economy. His successors were Professor James Mavor (1894-1923), Professor R. M. MacIver (now of Columbia University) (1924-1927), and Professor E. J. Urwick (1928-

1937). This department has shared in the establishment of later departments which reflect the necessary specialisation in the social services, such as law, sociology and geography; it still gives the courses in economics, political science and commerce and finance. To celebrate this jubilee, a series of lectures was planned to commemorate the work of the successive heads of the department itself and of the related departments, both in this University and in sister institutions, and to describe current trends in economic and political thought. Through distinguished alumni this department has played a great part in the life of Canada. The President gave an introduction to the series and the following lectures were given: By Prof. J. M. Clark (Columbia University)—"Industrial Stabilisation"; By Prof. A. P. Usher (Harvard University)—"Sir William Ashley"; By Prof. C. A. Ashley (University of Toronto)—"Sir William Ashley and The Rise of Commerce Schools"; By Prof. H. R. Kemp (University of Toronto)—"Prof. James Mavor"; By Prof. E. J. Urwick (University of Toronto) —"The Unity of the Social Sciences"; By Prof. R. M. MacIver (Columbia University)—"Social Sciences at the University of Toronto"; By Prof. J. Viner (University of Chicago)—"Classical Economics and Laissez-Faire"; By Prof. R. M. Dawson (University of Toronto)—"Democracy in the Modern World"; By Prof. H. A. Logan—"Labour Problems in Canada"; By Prof. Chester Martin (University of Toronto)—"Professor George M. Wrong"; By Prof. W. A. Mackintosh (Queen's University)—"Adam Shortt"; By Prof. H. A. Innis— "Professor Stephen Leacock".

In the department of economics and political science and in commerce and finance, courses have been instituted in public and in business administration. These courses begin to differentiate in the fourth year and are carried on for a postgraduate year. On the whole it has seemed wiser to our staff to lay a broad foundation of general economic history and theory before dealing too specifically with practical problems of administration and business. The famous School of Business Administration at Harvard is entirely a graduate institution.

The two thousandth anniversary of the birth of the Roman Emperor Augustus was commemorated last December by the Classical departments of the Colleges. Principal M. W. Wallace presided over a well-attended gathering at which addresses were delivered by Professors Norwood, DeWitt and Homer Thompson, on the political, literary and social aspects of this great period of ancient history. The publication of the Governor-General, Lord Tweedsmuir's excellent study of the life of Augustus added much public interest to this commemoration.

The Law Club, at its annual dinner in March, celebrated the coming of Lord Durham a hundred years ago. Professor Kennedy gave a succinct account of the constitutional aspects of the famous Report, and the Governor-General, Lord Tweedsmuir, spoke vividly on the character and achievements of Lord Durham himself.

Professor Lash Miller, who retired last year from the chair of chemistry, which he had held with distinction for many years, generously presented to the University his splendid private library. This contains rare books on chemistry, modern treatises, and a priceless collection of chemical journals. This library will be under the immediate charge of the professor of chemistry, and the University Library will spend $200 a year in keeping the series of journals up to date. The University gratefully acknowledges Professor Miller's valuable gift.

THE FACULTY OF MEDICINE

There are several features of the year's work to be noted:

The number of students to be admitted must not be too large for the available clinical material and for the comfort of the patients in the teaching hospitals. A selective process has been adopted at the end of the first year, and will be applied in the session 1938-39. Students who fail in their first year (including

supplemental examinations) will not be allowed to re-register in the first year. By this regulation the perpetual "repeaters" will drop out at the beginning, both to their own advantage and to the general advantage of the classes. A general standard of knowledge and ability will be secured sufficient to meet the exacting demands of medical training. But every consideration will be given to the first year students, lest any injustice be done them. Term work will be carefully recorded; test examinations will be given through the year, so that the teachers may have full opportunity of knowing the ability and the diligence of each student. When the results of the final examinations in the first year are known, the case of those who fail will be reviewed in the light of their whole record both in the secondary schools and throughout the university year. Even if a student, after this full consideration, fails, his time is not thrown away, as he can still register in some other course in the University. The adoption of this selective method, approved both by the Board of Governors and the Senate, is an important landmark in the development of the Medical Faculty.

The whole medical curriculum has been under review for some time by a committee of the Faculty and important changes for the better have been made. There is a general reduction in the number of hours devoted to lectures and laboratories, so that the students may have more time for individual study and reading and for clinical practice and observation. The aim of the teaching in the pre-clinical period is to introduce the student to scientific methods and the scientific habit of mind, to give him proper habits of learning and a stimulus to independent inquiry, and to equip him with such scientific knowledge as will be an adequate foundation for his strictly professional studies. In the clinical years, there will be a better correlation of lectures with laboratories. Some courses are being re-arranged, and there is a general increase in the practical training, notably in obstetrics. There is increased teaching of physical therapy on a scientific basis.

This committee of review will continue to work by investigating the curriculum for each year as a unit rather than from a departmental standpoint, and by broadly defining the objectives to be kept in view both in the basic medical sciences and in the clinical years.

Postgraduate courses, lasting for one week of intensive study in special branches of medicine and surgery, have now become a regular part of the work. This year the subjects dealt with were heart diseases, physical therapy and fractures. Medical practitioners attended, about thirty in each class, from various parts of the Province and even beyond its boundaries. One came from China and another from Peru!

The Governors purchased the valuable pathological library of the late Professor Oskar Klotz and have added it to the Medical Library. Professor William Boyd has made certain rearrangements of the objects in the Pathological Museum which facilitate the teaching and examination of specimens.

The enlargement of St. Michael's Hospital, one of our teaching hospitals, adds to the general clinical facilities of the Faculty of Medicine.

Dr. Bruno Mendel, who is working in the department of medical research on the fundamental problems of cancer, has been greatly aided by chemical results obtained through Dr. Hermann Fischer, research professor of organic chemistry, and his assistants, Dr. Baer and Dr. Grosheintz. All these members of the staff, together with others from the department of physiology and the Connaught Laboratories, attended the International Association of Physiologists held at Zurich this year.

As a result of the epidemic of poliomyelitis last autumn, Dr. Hall and Mr. Leibel of the department of medical research devised a respirator which has proved of value in many cases, and may have a wider use in cases of resuscitation.

FACULTY OF APPLIED SCIENCE AND ENGINEERING

Because of the material development of the country, young engineers are still in demand. In 1935 there were in attendance 766; in 1936 there were 789; in 1937 there were 833. It is probable that there will be a further increase next year, even though numbers are stationary or even less in other faculties. Many graduates find occupation in business and in executive positions. An engineering training develops resourcefulness, adaptability and accuracy—qualities of value in every walk of life.

The course in engineering physics has had its first graduating class and, because of its stiff requirements, attracts students who have a special aptitude for mathematics and physics. Another new course just established in that in mining geology, embracing two years of mining and engineering and two devoted mainly to geology.

There is an urgent need for more accommodation and equipment for chemical and mechanical engineering (especially for hydraulics). Laboratories are overcrowded and equipment cannot be properly placed.

It is my earnest hope that in the near future a new building may be erected to house chemical engineering in juxtaposition to the chemistry building of the Faculty of Arts. The removal of chemical engineering to a new building would leave vacant much needed space in the present mining building. Those chemical students accommodated in the economics building on Bloor Street could be brought back to the general chemical family, and their removal would make room for larger accommodation required for geography and psychology. A subcommittee of the Board of Governors has the whole question of these additions under consideration.

MUSIC

The honour course in music in the Faculty of Arts is now well launched and promises to develop healthily. Professors Willan and Leo Smith, appointed to the University Faculty of Music, and the Dean of the Faculty, Sir Ernest MacMillan, will have charge of the instruction both theoretical and practical. The relations between the University and the Conservatory of Music have become closer. Mr. Ernest Hutcheson of the Jouillard Foundation, New York, made a comprehensive survey of our whole musical situation. He enumerated the functions of a Conservatory as three: (*a*) to be a training school for professional musicians; (*b*) to be a general public school of music; (*c*) to be a public academical body closely connected with a university and exercising an important influence on the general musical life of the community through its examination system and by other means.

There has been an increase of 300 in the registration at the Conservatory; the number of candidates for its examinations has been 13,482.

FACULTY OF FORESTRY

Disastrous forest fires emphasise periodically the need for well-trained foresters to prevent vast loss of life and property. Since this Faculty of Forestry was established, thirty years ago, 409 students have registered and 258 have completed the course. They are working mainly in forestry and allied fields. Pulp, paper, and lumbering have absorbed about half of them. Thirty-three are in the Forest Service of the Province and seventeen in that of the Dominion. Eight are teaching in universities.

Two new courses of great practical importance were given during the year—one on fish and game preservation, and the other on the scaling of timber (this latter at the Faculty Camp).

THE SCHOOL OF GRADUATE STUDIES

The special direction in which the University of Toronto should grow is that of providing advanced instruction for graduate students. All universities are

not equipped to do this, but some Canadian institutions must assume this responsibility, unless we wish to see all our able graduates who desire to carry on additional research work going to the universities in the United States. Our University ought to develop this side of academic work. We are ready and able to do this if adequate funds can be found for this purpose.

In the Graduate School were registered 583, a small decrease from last year's numbers. Of these 421 came from Ontario. From 59 institutions these students have come, and from all the Provinces of Canada, as well as from Great Britain, China, Japan, the Bahamas, India, Newfoundland, Ireland, Switzerland and the United States. Of these students 178 have held positions on our staff as demonstrators or instructors.

The chief need of this School is an increase in the number of open fellowships. By means of the Reuben Wells Leonard bequest six additional open fellowships have been established, and these have been awarded to students from outside Ontario, in fulfilment of the generous donor's desire that, through the meeting of young men from various parts of Canada in one centre of research, the unity and higher life of the Dominion might be promoted and enriched.

FACULTY OF DENTISTRY

From England, Australia, New Zealand and India students have been enrolled. This Faculty stands high in the esteem of the dental colleges of the world, both for its sound fundamental scientific basis and for its progressive application of principles to practice. Valuable postgraduate work is being carried on in the ceramic department and under Dr. Harold Box.

The books of the late Dr. A. E. Webster (a former Dean of the Faculty) have been given to the Library and make a substantial addition to its contents.

THE SCHOOL OF HYGIENE

This School is now recognised as the chief centre of graduate teaching in public health, both in Canada and abroad. Since its opening in 1927, 182 medical graduates have received the diploma of Public Health and are now leaders in the field of preventive medicine in various parts of our Dominion and beyond its borders. To enable suitably qualified men and women to attend the school, 74 Rockefeller fellowships and 41 Connaught Laboratory fellowships have been given. Inasmuch as it is generally accepted today that nutrition is closely linked with the maintenance of good health, special research work is being prosecuted in the field of nutrition. The director, Dr. Fitzgerald, on behalf of the Rockefeller Foundation, was absent throughout the year, making a survey of the teaching of preventive medicine to medical students in Europe and North America. Much more attention is likely to be devoted to this phase of medical instruction in the future. Dr. Fitzgerald expresses his belief that "the future progress of preventive medicine depends as much upon an enlightened and alert medical profession as upon organised community effort conducted by departments of health".

The present building, once enlarged to double its original size, is already becoming crowded—so rapid has been the development of preventive medicine, and so vast the increase in the products of the Connaught Laboratories.

LIBRARY

The number of books in the Library is 352,155, and of pamphlets 135,395, a total of 487,550, and an increase of 16,380 over last year. We seem to have reached the peak of the extraordinary increase in the circulation of books among undergraduates that has taken place during the last few years. The total circulation for staff, graduates and undergraduates for the current year has been 360,223. This number takes no account of the large circulation of books in some of the departmental libraries.

The Library is open throughout the day and in the evening.

The late Inspector G. H. Armstrong of Toronto left a valuable library of books relating to education, Canadian history and geography.

The $500.00 prize won by our team in the Putnam Mathematical Competition from among similar teams from sixty universities in North America, has been handed over to the Library for the extension of the mathematical section.

The congestion in the stack room increases every year.

UNIVERSITY EXTENSION

This evergrowing department has completed its eighteenth year of service to the University and the Province under the energetic guidance of Mr. Dunlop. The number of adults who have taken continuous courses is 6712—3562 men and 3150 women. Through 182 extension lectures delivered by members of the university staff throughout Ontario probably 25,000 persons were reached. The evening tutorial classes, 52 in number, were attended by 3225 persons. The Workers' Educational Association had an enrolment of 1442 and were conducted in sixteen Ontario cities and towns.

For the third season an intensive course in Public Administration was conducted, with an attendance of 158. We are indebted to the Ontario Department of Municipal Affairs, under the Hon. Eric Cross, for generous and helpful co-operation.

Correspondence courses of various kinds are taken by 797 students.

The courses in occupational and physical therapy are the only ones of the kind provided in Canada. The increasing enrolment will soon call for larger accommodation. The demand for these trained workers still exceeds the supply. In the pass course for teachers 908 are registered. This year classes were held at Brampton and at Port Arthur and Fort William.

The last course to be added, under this department, is a two-year diploma course in Aerial Navigation. The curriculum closely resembles that in the British Air Colleges and the well-known Boling School of Flying in the United States. The physical standards for admission are set by the Federal Department of Transport; the subjects to be taught include mathematics, electricity and magnetism, applied astronomy, meteorology, map construction, navigation, aircraft-engines, radio and the theory of flight. Conversational French will also be taught. Practical flying will be taught elsewhere. Probably many who take this course will find a career on the ground as meteorologists, radio operators, despatchers, in the traffic business or mechanical departments. In any field these graduates will be fitted for the most responsible posts. There will be great developments in aerial navigation and any advance will make new demands on the men in aviation. This course should provide thoroughly trained experts. It will be our duty to keep this course in close relation to every advance which aerial navigation is so rapidly making. The first class will probably be about twenty in number. Our staff will give the necessary instruction. Among the teachers will be Mr. Robert McIntyre, who returns to us from a course in aeronautic engineering at Cambridge and from the practical experience of Farnborough. Professor T. R. Loudon has for years sought to develop such a course as this, and now sees his hopes fulfilled.

SOCIAL SCIENCES

Dr. Grauer has satisfactorily completed his first year as director. Professor Urwick continues to give valuable voluntary help. The department is seeking to keep the happy mean between scientific theory and practical work. It is important that a field worker in a public social service agency should have a high standard of training, such as can best be given in connection with a university. In university circles in the United States the problem of training social workers is receiving marked attention, in order to meet the demands of the State social services for trained workers. The best judgment there seems to be

that it is wise to concentrate training in a few of the more important universities, which can provide students with a good foundation in the social sciences.

The Sadowski scholarships in Sociology and in this Department of Social Science will prove a stimulus to the best students.

Intensive courses for social workers in the field are being planned for next year.

As soon as funds permit, the staff should be strengthened on the side of research in the social sciences. A professor to direct research on general social problems would be of value both to the students immediately under his care and to the community at large. Research in the social sciences lags sadly behind research in the physical sciences, but is even more urgently required.

SCHOOL OF NURSING

The large enrolment in the various classes is taxing the accommodation of the School to the uttermost. In refresher courses 187 nurses registered. Miss Russell, the director of the School, was absent for some months at the request of the Rockefeller Foundation to aid in a project of reorganising nursing education in London, England. There is good hope that some permanent endowment for this School may be obtained. Its methods of training are exerting an influence outside its own walls. As people realise that it is easier and wiser to maintain health than to cure disease, the sphere of preventive medicine and the public health nurse will be enlarged and appreciated.

MILITARY STUDIES

The total registration was 136. Students in the special classes may obtain through the C.O.T.C. and the War Office in London, qualifications for commissions in the various Imperial Services. The results of the War Office examinations held in March showed that 76 per cent of the candidates were successful. Major Barry Watson, the director, notes that owing to the increasing preference for university men in the Regular Army and Air Force, and the attractive conditions offered, a number of our graduates are adopting military work as a profession.

I hope that we may soon be able to provide more commodious quarters for this work, as numbers and interest are increasing.

HEALTH SERVICE

Dr. George Porter states that the number of men examined was 2296—the largest on record—because of 710 senior students coming in for health certificates. Only 19 were unfit for physical training. The average height of our first year students is 5 ft. 9¾ in. and their average weight 144½ lbs. This is our highest average. Our freshmen stand first in height among eleven of the best American Universities and second in weight. In the last sixteen years there is a general upward trend—due probably to good nutrition and bodily exercise.

Dr. Edith Gordon reports that of the women entering University College, medicine and household science, 214 were examined and 83.2 per cent were fit for gymnasium and swimming requirements. From the other years and from other colleges, 306 were examined, including 66 who voluntarily came for a re-examination before leaving college. Intercutaneous tuberculin tests were made on all incoming students, and on those whose previous tests had been negative. Two cases of active tuberculosis were discovered among those entering for the first time and both are now receiving treatment in sanatoria.

Tests of hearing were made as an experiment and will probably become a regular part of the physical examination.

The tuberculin tests so successfully and helpfully applied to women students will, I hope, in the near future be applied to all students in the University.

The question of the Health Service is engaging the careful attention of the Governors and committees are considering necessary improvements and enlargements.

RESEARCH

The spirit of research permeates the whole university. Details of the various investigations in progress will be found in the reports that follow. Some are in the field of pure science and some in the applications of science to health, and industry. It is notable that more and more researches are being carried on by groups; and co-operation of related departments is essential to progress.

I may refer particularly to the work of Sir Frederick Banting and his colleagues in silicosis and in fundamental cancer problems; to the continued testing of heparin in the treatment of human beings; to the experiments at the Sick Children's Hospital and in other departments on the relation of nutrition to health; and to the romantic and amasing development of the Connaught Laboratories.

This kind of work is necessarily expensive and requires adequate funds and accommodation. This leads me again to state that one of our immediate needs is the addition of two storeys to the Banting Institute. Dr. Banting's work is undoubtedly being hindered by lack of space both for his research colleagues and for the animals required in experiment. Professor Hermann Fischer and his two colleagues in organic chemistry are at present housed in this already crowded building, until we can get the money to erect an extension to the chemistry building. Splendid work is, however, being carried on in spite of the limitations of space. After all it is the man, more than the material structure, that counts.

I have elsewhere noted that provision should be made for more research facilities in connection with the social sciences. It is easier to master matter than to master ourselves. The social sciences are the formulation of those human relations by which we master ourselves and are able to live happily and helpfully together.

INSTITUTE OF CHILD WELFARE

The St. George School, financed by the Rockefeller Foundation and conducted by a committee appointed by the Board of Governors, is being put upon a new basis. The present School is being made an institute of child study under the direction of a Council appointed by the Board. The committee felt that as a separate entity the services of the staff of the St. George School could be made more readily available to the various faculties and departments interested in the study of child development. This change has been made on the following grounds: (1) Such an institute is and has already made distinctive contributions to the understanding of the training and problems of the young child; (2) It is the only school in Canada where teachers of children of pre-school age can obtain the necessary education in this field; (3) It is the only centre from which the theory and technique of parent education can be studied and presented. The results already obtained are seen to be of great value to the teachers in our Public School system; (4) Instruction in the field of child care is increasingly demanded in public and private school services and social welfare work. Formal courses in the University are now given in the following Departments: The faculty of household science, the departments of social science, psychology, occupational therapy, nursing and psychiatry. Forty-five students who have worked in this school have obtained the degree of M.A. and one the degree of Ph.D. Of the graduates working in the field of Child Study in the community nine are in government services, seven in nursery school and kindergarden positions, three in personal advisory work, two are principals of private schools and one is in social welfare.

Sixty-seven students completed the course for professional leaders in Parent Education and sixty groups have been conducted during the college year, attendance at which has reached the total of two thousand.

The committee recommended that the following departments be represented on the Council of the Institute of Child Study: two from the College of Education, and one each from the departments of psychology, social science, household science and medicine, together with the Director of the Institute, Dr. W. E. Blatz, and the President of the University. The Board of Governors have duly confirmed this recommendation of the committee.

The importance of the pre-school age in relation to the child's subsequent development is being increasingly recognised. This Institute of Child Study is really doing pioneer work in an important field.

THE LIBRARY SCHOOL

As a result of the inspection made last year by the American Library Association, it has been decided to strengthen the staff of the School by the addition of a full-time instructor.

The course is now so arranged that one-third of it is given to basic technical knowledge, one-third to knowledge of books, and one-third to administrative problems and special lectures.

SCHOLARSHIPS, BURSARIES AND LOANS

I am glad to note that the list of scholarships, bursaries and loans in all colleges and faculties is increasing. The help which these can give often makes the difference between attendance at the University or non-attendance, continuance or non-continuance. Both in number and in amount our scholarships might well be extended. The problem created by the increased cost of education differentiates against the non-urban population. The rural population cannot as well afford higher education as once it did. Thus educational opportunities for city and country can but be equalised by scholarships and bursaries specially allocated to students from outside the university centre. Yet we must not forget that brilliant students from the city may also stand in need of financial help.

FALCONER LECTURESHIP

Friends of Sir Robert Falconer, President-Emeritus, of this University have raised a sum of money to establish a lectureship in his honour. The lectures will be given every second year and the subject will be some phase of international relations. Our special lectureships are being steadily increased. In Medicine are the Mickle and the Balfour lectures and in Arts the Marfleet (on Canadian-American relations), the Alexander (on English literature), and now the Falconer.

ATHLETICS AND STUDENT ACTIVITIES

Owing to the athletic fee, which the students themselves asked to be imposed, the students have been able in greatly increased numbers to be present at the Intercollegiate Games and to engage in various sports previously out of their reach, and, best of all, the gymnasium and swimming pool have been opened at night.

The Senior Rugby Team lost the championship by one point to their old and gallant rivals of Queen's University.

The new athletic fee has given greatly increased facilities for exercise and recreation to the women students, notably in connection with golf and riding.

The new athletic building for women is still in the future. Our financial resources do not allow us to proceed with its erection at present. The gift of such a building would be of inestimable benefit to the health of the women and would provide accommodation for a more thorough course in physical education. Here is an opportunity for a generously disposed friend of the young women of the Province.

In the regrettable absence of the Warden of Hart House, Mr. J. B. Bickersteth, Mr. J. R. Gilley, the Controller, acted in his stead. Mr. Bickersteth has made such progress to recovery that his return is expected for the coming year. Mr. Gilley and his assistants have "carried on" admirably. In his report will be found the details of the social, intellectual, recreational, artistic and religious work of the House. The Hon. Vincent Massey, our High Commissioner in London, never loses his interest in Hart House. He has sent out a "coronation chair", used by one of the peeresses in Westminster Abbey at the Coronation Service, and this has been placed in the Hart House Library. He has also sent one of the plaster of paris lions, holding a shield with Canada's arms upon it, which adorned the temporary annex built at the west end of the Abbey for coronation convenience. This has been set up on a pedestal in the Debates Room.

One of the most interesting reports is that presented by Mr. E. A. Macdonald, secretary of the Students Administrative Council, on the varied and increasing activities of this organisation, which represents the whole student body. I cannot speak too warmly of its work and of the help I have received from Mr. Macdonald, its kindly, competent and efficient executive officer.

It publishes a Students' Handbook, the *Varsity*—the student newspaper, and *Torontonensis*, the annual year book containing the photographs of the graduating class and a description of all student activities. It bore half the cost of printing the *Directory*—a charge that should properly be borne by the University. It finances inter-collegiate debates, the band, the orchestra, and other student projects.

It has established a loan fund which has been a wonderful help to students. These loans have been so well repaid that it has been possible to loan in all about $18,000. Boarding houses for students are inspected and listed. An employment bureau has been in existence since 1933, to secure for students summer, Christmas and part-time work. Last year 1486 students were referred to positions, and this year the number is even larger. Owing to the increased activities of the Council, the Governors provided additional accommodation in Hart House.

DAVID DUNLAP OBSERVATORY

The famous 74 inch telescope continues to operate most efficiently. The number of clear working hours was 1273, and during this period 1216 photographic plates were taken. The publication of results will soon begin.

The 19 inch telescope has been put into operation.

ROYAL ONTARIO MUSEUM

The reports of the various directors are full of interest. The Sigmund Samuel Gallery has been opened to receive the great collection of Chinese books, called the "H. H. Mu Library", over 50,000 volumes.

The archaeological section has acquired several treasures of mediaeval art and sculpture.

A study of the fauna of Ontario, made by the museum of zoology, is being continued by summer surveys in various remote parts of this huge Province.

In the galleries of the museum of palaeontology have been installed a magnificent series of mural paintings, the work of the eminent artist, Mr. G. A. Reid, R.C.A. These portray the history of the world from its misty beginnings to the ordered world, as we know it to-day.

The total attendance at the Museum during the year ending on the 30th June was 268,872.

THE PRESS

Mr. Gordon Burns, for some years assistant manager, has been appointed manager of the Press. A new press of large size, new binding machinery, and much new type have been purchased, and the whole interior has been cleaned

and more conveniently arranged. Every year new books, written by members of our staff, are being published. The Oxford University Press and the University of Chicago Press are handling our publications in Britain and in the United States.

ALUMNI FEDERATION

The Alumni Federation under its secretary, Mr. Byron Wood, continues to keep the graduates in touch with their *Alma Mater*. The *University Monthly* is full of interesting news and should be read by all graduates. During the year I addressed gatherings of our Alumni at Ottawa and at Chicago. Branches of the Federation have been revived at these centres. I hope that an increasing number from the very day of graduation will enroll as members of the Federation and help to form a public opinion, which recognises the value of higher education to the nation and which especially rallies to the support of our own University.

UNIVERSITY BUILDINGS

Col. Le Pan, the superintendent of buildings, has charge of the material fabric of the University and carries on a work of supervision, repair and construction, the extent of which is scarcely realised but which reflects the magnitude of the institution. On his office staff fourteen persons are employed. The number of buildings (not including buildings of the Federated Colleges) is 58. The number of employees (carpenters, painters, electricians, plumbers, tinsmiths, labourers, cleaners and caretakers) is 274; their salaries and wages (including services rendered to the Connaught Laboratories, Hart House, the Athletic Association, the Royal Ontario Museum and the Federated Colleges) amounted to $324,000. Customs entries for equipment and books for all departments reached a total of 1336. The turnover in the Post Office was $36,000. The cost of coal was $105,000. Repairs and renewals amounted to $83,000 (which is less than one-half of one per cent of the value of the buildings). The capital expenditure at the Royal Ontario Museum, the Hygiene Building and the Connaught Laboratories Farm amounted to $60,000. The number of accounts on which work was done for separate financial entities was 6,170.

The addition to the Royal Ontario Museum has been completed, and provided space for the Chinese Library and additional offices. The money for this was given by the Ontario Government, Dr. Sigmund Samuel and Sir Robert Mond, and the new galleries are named "The Samuel Galleries".

We congratulate Trinity College on its new residence for women undergraduates. This seemly and commodious building—St. Hilda's—will accommodate 73 students and will be ready for occupation for the session 1938-9.

VISITING LECTURERS

During the year the following special lectures were delivered:

On the Alexander Foundation a course of five lectures by Dr. Carleton Stanley, President of Dalhousie University, on "Matthew Arnold"; the Donald C. Balfour lecture in surgery by Dr. Gordon Gordon-Taylor, senior surgeon Middlesex Hospital, London, England, on "Gastric Haemorrhage"; a lecture by Professor Hugh S. Taylor of Princeton University, on "Holes in liquids and their consequences"; a lecture by Professor Harold C. Urey of Columbia University on "Isotopes"; a lecture by Professor Morris Ginsberg, of the department of sociology, University of London, England, on "Social Development"; a lecture by Mr. Harrison Brown, correspondent for the British Broadcasting Corporation, on "The Successes and Failures of the Fascist Bloc"; a lecture by Dr. W. E. Gye, Director of the Imperial Cancer Research Fund, London, England, on "Cancer Research"; a lecture by Dr. Donald D. Van Slyke, Charles Mickle Fellow for 1936, on "Neutrality regulation of the organism"; a lecture by Professor E. J. Dent, Professor of Music, Cambridge University, on "Music in university life"; a lecture by Dr. Hans Simons, New School of Social Research, New York, on

"Europe of to-day and the world of to-morrow"; a lecture by Mr. Frank Rising, editor of "Business Week", on "Trade Unions in the United States"; a lecture by Dr. Alfred C. Lane, Boston, Mass., on "Recent work on the measurement of geological time"; a lecture by Dr. W. I. Jennings, of the Faculty of Law, University of London, on "The Law and Custom of Cabinet Government in England".

In connection with the Department of Physics two special courses of lectures on "The Physical Principles of Television Tubes" and "Refrigerated Storage and Transport" were arranged, and nine lectures delivered by Dr. W. H. Kohl of the Research Laboratory of Rogers Radio Tubes, Ltd., and special lecturer in the department of physics on "The History of Television"; "The Cathode Ray Tube"; "The Iconoscope"; "The Kinescope"; "The Electron Multiplier"; "The Photoelectric Image Tube"; "The Electron Gun"; "High Intensity"; "Fluorescent Screens"; "Secondary Emission": five lectures by Dr. W. H. Cook, of the Division of Biology and Agriculture of the National Research Council, Ottawa, on "General Refrigerated Storage and Transport"; "Temperature"; "Humidity"; "Atmospheric Composition"; "Special Problems".

University College, Department of English, arranged an exchange with Professor W. C. DeVane, head of the English Department, Cornell University, and with Professor Herman J. Weigand, head of the Department of German, Yale University.

Professor E. K. Brown visited Western Reserve University at Cleveland. His subjects were: "Matthew Arnold and the Eighteenth Century"; "Mr. Eliot and his enemies"; "Higher Studies in English at the Sorbonne".

The following lectures were given in Convocation Hall under the auspices of the Royal Canadian Institute:

By Professor J. Ellis Thomson, Professor of Mineralogy, University of Toronto, on "Presidential Peregrinations to the Pacific"; Mr. Matthew William Stirling, Smithsonian Institute, Washington, D.C., on "By Airplane to Pygmyland"; Dr. Karl K. Darrow, Research Laboratory of the Bell Telephone Co., New York, on "Transmutation"; Dr. Harold E. Edgerton, Assistant Professor of Electrical Measurements, Massachusetts Institute of Technology, on "Seeing the Unseen with high-speed Photography"; Dr. George M. Sutton, Curator of Birds at Cornell University, on "A year with the Eskimos of Southampton Island"; Mr. J. A. Wilson, Department of Transport, Ottawa, on "The Trans-Canada Airways"; Professor H. E. T. Haultain, department of mining engineering, University of Toronto, on "From Rock to Dollars"; Dr. Laurence M. Gould, Professor of Geology, Carleton College, Northfield, Minn., on "Antarctic Geological Adventures"; Dr. Guildford B. Reed, Queen's University, Kingston, on "Man and his Microbes"; Mrs. Mary Vaux Walcott, Washington, D.C., on "Wild Flowers of the Canadian Rockies"; Professor K. B. Jackson, University of Toronto, on "Aerial Photographic Surveying"; Dr. Harold C. Urey, Columbia University, on "The Isolation of "Isotopes"; Dr. W. H. Cook, National Research Council, Ottawa, on "Food Preservation"; Professor L. J. Rogers, University of Toronto, on "Scientific Crime Detection"; Dr. W. B. White, American Steel and Wire Company, Chicago, on "Musical Sounds and Their Engineering"; Mr. Denton Massey, M.P., Toronto, on "The Social Experiments in Sweden and Denmark"; Dr. Robert Chambers, New York University, "The Cell as the Architectural Unit of the Body"; Dr. William Boyd, University of Toronto, on "Growth—innocent and malignant"; Dr. Hugh S. Taylor, Princeton University, on "Chemistry and your Automobile"; Mr. Lionel E. Taylor, Plant Explorer, on "Plant Hunting in South Africa".

LEARNED SOCIETIES

The following Learned Societies met at the University:

The American Physical Society; The American Association of Physics Teachers; The American Society of Mechanical Engineers.

SPECIAL CONVOCATIONS

Two special convocations were held, when honorary LL.D. degrees were conferred, October 22nd, upon The Honourable Cordell Hull, Secretary of State, Washington, D.C., and March 21st, upon Sir Howard d'Egville, K.B.E., of the Empire Parliamentary Association, London, England.

BENEFACTIONS

During the year the University has received the following benefactions, totalling $185,932.72:

From the estate of the late Reuben Wells Leonard, $57,350.69; Rockefeller Foundation: Child Research and Parent Education, $15,009.90, School of Nursing, $9,993.99; Eaton Endowment, $25,003.89; Sir Robert Falconer Foundation, $16,115; Ontario Mining Association grant for research in silicosis, $10,000; Carnegie Corporation: Fine Art, $4,995.51, Workers' Educational Research, $1,498.59, Physiology research, $552.06; E. A. Wallberg Memorial Fund, $7,036.57; Anonymous, for organic chemistry, $5,000; For J. S. McLean Fellowships: Canada Packers, $2,500, Mr. J. S. McLean, $2,500; Reuben Wells Leonard Fellowship and Scholarships, $3,700; W. P. Mustard Scholarship, $3,000; Geophysics Research Fund, $2,400; Eli Lilly Fellowship, $2,002.19; Graduate Fellowships: Estate of the late Sir Edward Kemp, $1,000, Imperial Oil Ltd., $500, Sir Joseph Flavelle, $250; Flavelle-Peacock Retiring Allowance: Sir Joseph Flavelle, $750, Sir Edward Peacock, $750; Bickle Bursary, $1040; D. A. Dunlap Memorial Scholarships, $1000; Arthur Cohen Scholarship, $1000; Standard Brands, research fund for chemistry, $999.07; Medical Society Bursary, $600; William Lowell Putnam Prize Fund, $505.31; J. W. L. Forster Library Fund, for fine art, $500; Emerson Wickett Memorial Scholarship, $500; Sadowski Scholarships, $500; John Northway Memorial Fellowship, $500; Sir Edmund Walker Scholarship, $450; Robert Simpson Company Scholarships, $450; University College Alumni Matriculation Scholarship, $400; Gertrud Davis Exchange Fellowship, $400; Robert Bruce Scholarship, $387.64; Johannesburg Chamber of Mines Donation, $351.75; J. A. Findlay Scholarship, mechanical engineering, $330; Toronto League for Race Betterment Scholarship, $300; School of Nursing Undergraduate Bursary Fund, $300; S. R. Parsons Scholarship, commerce and finance, $250; Mr. Robert A. Bryce, U.T.S. Engineering Scholarship, $250; J. B. Willmott Scholarships in Dentistry, $250; Percy Hermant Scholarship, $250; Anonymous, for Mary Keenan Award, $200; Delta Phi Epsilon Bursary, $200; Pan-Hellenic Association Prizes, $150; Boiler Inspection and Insurance Company Scholarship, mechanical engineering, $150; Anonymous, for special research in biochemistry, $125; Sir John Eaton Memorial Scholarship, University Schools, $120; University College Alumnae Scholarship, $100; Maurice Hutton Matriculation Scholarship, $100; University Tours Association Scholarship, $100; Darling and Pearson Prizes in architecture, $100; Herbert Willson Scholarship, $100; Toronto Brick Company Prizes, architecture, $100; Ontario Association of Architects Scholarship, $100; George Kennedy Scholarship, $83.10; Sarah Kennedy Scholarship, $83.10; St. Margaret's College Alumnae Scholarship, $75; Ramsay Wright Scholarship, $53.36; Hollywood Theatre Prizes in French, $50; Dr. R. A. Reeve Prize in Medicine, $50; Toronto Women's League of the United Synagogue Scholarship, medicine, $50; Public Speaking Association Bursary, $50; F. W. Jarvis Bursaries, $50; Hon. Charles McCrea, for Dent McCrea Scholarship, $50; Hon. Justice Riddell, for Riddell Scholarship in law, $30; Lambda Chi Alpha Alumni of Toronto, for Saddington Medal, $26.75; Hon. Dr. J. A. Faulkner, for Faulkner Medal, $26.53; Labour Research Institute Prize, $25; Engineering Institute of Canada Prize, $25; Ontario Medical Association Prize, $25; U.C. French Society Prize, $25; American Society of Heating and Ventilating Engineers, $25; University College Alumni Prize, $25; B.A.A.S. Fund, $21.81; Maurice Cody Memorial Scholarship, University Schools, $10; Alumnae Prize in English, $10.

OUR NEEDS

A living institution like a university always has needs. As far as I can see at present, we have filled the gaps in our teaching staff. But our first need is for an adequate annual maintenance, if the efficiency of the institution and its service to all Canada are not to be impaired. In regard to buildings, we require, in my opinion, as soon as the necessary funds can be found:

Two additional storeys for Medical Research on the Banting Institute.
A new unit for Chemical Engineering.
An enlargement of the present Chemistry Building in the Faculty of Arts.
An addition to the Mechanical Engineering Building, for hydraulics and other purposes.
An Athletic Building for the women of the University.
A new residence for University College.
More space and more books for our Central Library.

GENERAL CONSIDERATIONS

Those who are interested in education are pointing out that it must have two objectives. First it must insure to the mass of our young people adequate training for the actual problems of living they will meet—that is, the mental discipline necessary to make a living and to enjoy life itself; and secondly, it should provide opportunities for the limited group who possess the natural ability which will qualify them for leadership and higher service in the community and the world of science. Some selective process for university education seems inevitable. Some kind of test of fitness, usually an examination, is applied. Much attention must be given to devising the best type of examination for choosing those students who will profit most by the discipline of higher education. Closely connected with this problem of selection is the problem of giving financial assistance to students of ability whose family or individual resources are insufficient. No economic group in the community should be excluded from the benefits of the highest education. Hence the necessity for an adequate scholarship policy throughout the university. There will always be a place for student self-reliance and self-help, but opportunities for finding work in vacations are not as great as they used to be, and there is a keener realisation of the cost to health and well-rounded development at which a student has too often obtained his university and professional training. President Conant of Harvard sums up the case in these words: "With the increasing emphasis on the importance of having a student's scale of living commensurate with physical well-being and the growth of a well-adjusted personality, the need for scholarships and other forms of aid becomes more pressing." I note with great satisfaction the growth of scholarships, bursaries and loan funds in our own university, but more are needed.

The universities of Canada are powerful influences on behalf of the unity of Canada. They are engaged in the common task of imparting, widening, distributing and enjoying the content of knowledge. Professors pass freely from one university to another. Students often exchange universities in their third year. There is an organised conference of Canadian universities. At the same time no institutions do more to foster an imperial and an international outlook, in contradistinction to that doctrine of blood and race and extreme nationalism that is wrecking the unity of the world, in a spirit of exclusiveness, suspicion and hate. In Canada today we need to emphasise those factors that make for unity, even amid the widest diversity of resource, tradition and interest. One of these factors is our common loyalty to the Crown and to British institutions, another is our community of educational and religious ideals.

It will always be difficult in educational curricula to keep the happy mean between specialisation and a broader general training. In some way we must combine the good in each. Here we have not a case of "either—or", but of "both—and". The specialised courses, for which this University has become

famous, must be built upon a foundation of liberal culture. For our specialised undergraduate courses, we have probably reached a reasonable limit. Further specialisation can best be carried on in the postgraduate school. A common first year in science, in applied science, and in philosophic and social studies, is becoming the rule. As I have already stated, our courses in public and business administration are based upon a foundation of economic, political and philosophic studies.

Among the aims of a true education are a reasonable knowledge of facts, the ability to think clearly, willingness to learn, and a sense of the fitness of things. The broader a man's education is the better able is he to deal with the problems of today. Specialisation may be carried to the point where the law of diminishing returns becomes operative and where the number of professional and business men, politicians and educators who have a broad outlook is definitely limited.

Among the unifying factors at the University athletics must take a high place. All colleges and faculties are represented on the teams, which uphold the honour of the University of Toronto on the field. The *Varsity*, the undergraduate newspaper—itself a great potential and actual influence for university consolidation—has editorially remarked: "Beside the benefits gained by the participants themselves, there is that intangible thing called college-spirit which comes to the fore when undergraduates get together in a student section to cheer their team on to victory. College-spirit may be defined as the desire to cooperate for the good of the college." University-spirit is the desire to cooperate for the good of the whole university. When there are so many and so varied groups on our campus, there is danger of disintegrating tendencies, nothing better integrates the student body than common interest and pride in an athletic team which bears the name of the University of Toronto.

It is well to remember that there is no such thing as "painless education" and that sturdy mentality and character will not be reared by too much humouring of individual taste. A shrewd observer of educational tendencies—himself a great captain of industry—has expressed his conviction that undue emphasis is placed on the interest factor, as opposed to the factor of mental discipline. Undoubtedly if mental effort is to be fully effective there must be interest; but to eliminate the element of mental discipline and to assert that, when there is no interest (at least at the outset), it is futile to attempt to educate, is a doctrine of doubtful validity. It is probable that effort will create interest just as frequently as interest creates effort. We value most those things for which we worked hardest. The Headmaster of the Leys School at Cambridge, England, used words of boys which are as applicable to university students: "A system of education which allows boys to leave school without ever having had to do things which they disliked and without ever having had to face real difficulties is not calculated to produce a very effective type of citizen." If a youth never learns that the supreme values in life have to be struggled for mentally, morally and physically, he will not be well equipped to meet the problems of life. Can any one learn anything worthwhile without consistent effort—without, in Newton's phrase, "thinking about it all the time"? Further, is there not a danger that our youth, if nurtured mainly on the motive of interest, will conclude that the "great achievements of civilisation are a God-given right to which they are justly entitled, almost irrespectively of personal effort"? Perhaps, as in most fundamental antinomies, the answer is found in the effort to combine interest and discipline.

How far can education prove a bulwark of sound democracy in our country? Only so far as educated men actively participate in public affairs. An American university president, the Chancellor of New York University, describes his fellow-citizens in words that may in some measure be applied to ourselves: "We are a tolerant people. We are also an apathetic people when it comes to public affairs. We are good citizens to a degree. We pay our taxes when we can. We are

orderly and law-abiding. Many of us go to the polls on election day. But we do not concern ourselves with matters of government as we should. . . . Few of us get very much excited about such matters, at least until things begin to tumble about our ears. We are pretty good followers, we college-trained men and women, but seldom do we show inclination toward public leadership. . . . We now and again feel ourselves the 'forgotten' class, forgetting it is mainly our own fault. An educational programme that fails to seek improvement of this state of affairs is missing something." We in Canada should rather follow the British tradition and practice of using higher education as an approach to and equipment for public service. The State pays a substantial part of the cost of university education, it has a right to the intelligent service of its privileged sons and daughters. I believe that many of these would gladly serve if the opportunity were open to them. Many of the courses we are now offering in the University directly help to fit men for public administration and public life. The general effect of a university course should be to deepen that sense of public responsibility without which higher education would fail to become a factor in preserving the ideals and principles of democracy. A sane democracy can be maintained only if the citizens are intelligent, interested, honest and religious. Democracy based only on some inherent right of man is everywhere imperilled. I believe it can survive only if it is rooted in the religious faith of a people, such a faith as recognises the worth of the individual in the sight of God. To men and women whom education has fitted for some kind of leadership the challenge comes: What are we doing with our democracy? Are we using it to best advantage? Are we making it work? Are we keeping it pure?

This is the testing time for democracy. Just because our system is based on freedom, the responsibilities of the individual are greater than they are in totalitarian states, where a man must do in every detail what the authorities tell him to do, whether he likes it or not. We do not want wholesale regimentation, but we must practice self-discipline. We want a people, not apathetic, but capable of showing enthusiasm over something, a people with a sense of public as well as of private duty, a people conscious of responsibility to safeguard freedom both at home and in all parts of the world. Courage, discipline, efficiency and leadership are as necessary to democracy as to dictatorship, and will be used in a nobler cause.

CONCLUSION

It is no light task to administer the academic affairs of this University and to bear the anxieties about expenditures which limitation of funds necessarily creates. But my helpers have been many. To the teaching staff, to the administrative officers, to the benefactors, to the fine body of loyal and self-disciplined students, to the chairman and members of the Board of Governors, who have given help, wisdom and encouragement, and to the Government of the Province which has largely provided for our yearly maintenance, I offer a full measure of gratefulness.

All of which is respectfully submitted.

H. J. CODY
President

November 10, 1938

APPENDIX A

(1) Report of the Dean of the Faculty of Arts
(2) Report of the Principal of University College
(3) Report of the Dean of the Faculty of Medicine
(4) Report of the Dean of the Faculty of Applied Science and Engineering
(5) Report of the Dean of the Ontario College of Education
(6) Report of the Secretary of the Faculty of Household Science
(7) Report of the Dean of the Faculty of Forestry
(8) Report of the Dean of the Faculty of Music
(9) Report of the Dean of the School of Graduate Studies
(10) Report of the Dean of the Faculty of Dentistry
(11) Report of the Director of the School of Hygiene
(12) Report of the Librarian
(13) Report on Research
(14) Publications
(15) Report of the Director of University Extension and Publicity
(16) Report of the Director of the Department of Social Science
(17) Report of the Director of the School of Nursing
(18) Report of the Director of the Department of Military Studies
(19) Report on Health Services
(20) Report on Athletics and Physical Training
(21) Report of the Warden of Hart House
(22) Report of the Director of the Connaught Laboratories
(23) Statement regarding the Museum of Archaeology
(24) Statement regarding the Museum of Biology
(25) Statement regarding the Museum of Geology
(26) Statement regarding the Museum of Mineralogy
(27) Statement regarding the Museum of Palaeontology
(28) Statement regarding the educational work of the Royal Ontario Museum
(29) Report of the Director of the David Dunlap Observatory
(30) Report of the O.C. The Canadian Officers' Training Corps
(31) Report of the Secretary-Treasurer of the Students' Administrative Council

(1) REPORT OF THE DEAN OF THE FACULTY OF ARTS

(Professor S. Beatty)

The honour course in Music got under way in 1937-38, with 8 students in the first year. The enrolment in the third year of the general course was almost three times the average of that in preceding sessions, while for the fourth year the corresponding enrolment was nearly doubled. The increase in attendance during 1937-38 over the earlier figures is due to the provision whereby successful students in the second or third years of honour courses, as well as certain types of these not successful, may be transferred to the next higher year of the general course. The original arrangement remains in force, whereby students who have adequate standing in the second year of the pass course may enter the third year of the general course. It will be interesting to watch the development of the general course, particularly in relation to the type of student taking it and the affect which it may have on standards in the second and third years of honour courses.

The Council has always given a great deal of consideration to the system of honour courses, both in the abstract and in relation to the reactions of students. Naturally, there must be a balance between these two, in the sense that both must be taken into account. It is to be expected that individual departments will assume more and more responsibility for adjusting the content and manner of their courses to the capacity of their students, always keeping in mind that conviction rather than merely formal assent is what must be looked for in these who are to profit by the instruction which they receive.

It is gratifying to realise that the schedules of scholarships and bursaries in the various Colleges are constantly expanding. In several cases, bursaries make the difference between attending and not attending the University. The system of loans to students by Alumni organisations is a significant and valuable development, both for what it accomplishes and for the contact which it implies between the Alumni and the life of the University.

(2) REPORT OF THE PRINCIPAL OF UNIVERSITY COLLEGE

(Professor M. W. Wallace, M.A., Ph.D.)

I have the honour to submit my annual report as Principal of University College:

Last year I had to report the resignation of Professor H. J. Davis of our English Department who accepted a post as head of the department of English in Cornell University. Once more the same American university has taken one of the most able of the younger members of our staff—Dr. Victor Lange, lecturer in the department of German, who has been appointed associate professor of German in Cornell. Dr. Lange came to us in 1930 as the first German student on the Gertrud Davis Exchange Fellowship. In 1933 he joined the staff of the college as lecturer in German. Dr. Lange has rendered admirable service to his department,—as a productive scholar, a highly successful teacher, and a wise and intelligent interpreter of the literature and history of his native land. We regret his departure exceedingly. He carries with him to his new position the warmest good wishes of his colleagues in Toronto.

Professor E. A. Dale was granted leave of absence during the Easter term for study in Greece and Italy. Professor C. N. Cochrane will spend next session in London and Oxford supervising the publication of a volume which deals with Roman history during the early centuries of our era, and which is to be brought out by the Clarendon Press. Professor Winnett of the department of Oriental Languages will spend the Michaelmas term in research work in Palestine and Arabia, and Professor Endicott of the department of English the Easter term at the Huntingdon Library in Pasadena, California.

As usual many members of the graduating class have won fellowships in other universities where they will pursue graduate studies. Mr. A. H. Jarvis of the department of philosophy was appointed Rhodes Scholar for Ontario; this is the fifth successive year in which this honour has come to University College. Mr. W. C. Smith of the department of Oriental languages secured the Massey Scholarship in the University of Cambridge, Mr. G. D. A. McPherson the J. S. McLean Fellowship in the University of London, Miss Constance Lailey the Gertrud Davis Fellowship in the University of Leipzig and Mr. H. C. Keenan the Leonard Fellowship in the University of Toronto.

Perhaps the most striking testimony to the high scholarship of our undergraduate body has been furnished by the department of Mathematics. In April of this year the Mathematical Association of America conducted a competition open to teams of three, or to individual contestants, from colleges and universities in the United States and Canada. Altogether there were 163 individual contestants from 67 institutions. When the results were announced the University of Toronto stood first, California second and Columbia third. The Toronto team was composed of A. J. Coleman and N. S. Mendelsohn of the third year and I. Kaplansky of the fourth year. Mr. Kaplansky also secured the highest standing of any individual student in the competition. All three of the successful candidates were students of University College.

The benefactions of graduates of the college continue on the ample scale to which we have become accustomed. Among the gifts received during the present session are the following:

(*a*) Two scholarships in the honour course in sociology, one in the second and one in the third year, of the value of $125.00 each, the gift of Mr. B. Sadowski who graduated from the college in 1918 in the honour course of mathematics.

(*b*) The Herbert Willson Scholarship in the second year of the honour course in biology and medicine of the value of $100.00, the gift of Miss Alice Willson of the class of 1894 in memory of her brother, Dr. Herbert Willson.

(*c*) The Wilfred P. Mustard Scholarship in Classics to be paid from the income of a sum of $3000.00 given by Dr. J. W. Mustard and his two sisters in memory of their brother, Professor Wilfred P. Mustard, for many years head of the department of classics in Johns Hopkins University, and a graduate from University College in 1886.

(*d*) The Maude Charlton Gibson Scholarship to be paid from the income of a sum of $1500.00 bequeathed to the college by Mrs. W. A. Charlton in memory of her daughter who was the wife of Mr. John J. Gibson, a member of the Board of Governors.

(*e*) The renewal for a fourth year of the prize of $50 in oral French, the gift of the Hollywood Theatre.

(*f*) A prize of $50 given by the Public Speaking Association of Toronto and to be awarded at the discretion of the College Council.

(*g*) A prize of $25 given by the Alumni Association of the college, and to be awarded at the discretion of the Council.

(*h*) A scholarship of $150, given by Mr. Arthur Cohen, K.C., and his wife, to be awarded to a student of University College in English at the end of the first year.

A course of five lectures on Matthew Arnold was delivered by President Carleton Stanley of Dalhousie University in Hart House on January 31st and the first four days of February. The lectures will be published during the summer by the University Press. The regular college course of public lectures was given during the Michaelmas term on *Aspects of the Victorian Era.* The lecturers were Professors Mackay, Endicott, MacCallum, Coventry, Urwick, Bladen and Creighton.

We have continued our recent practice of informally exchanging lectures with other universities. During the present session we have had visits of two or three days from Professor DeVane, recently appointed Dean of Yale College,

and Professor Weygand, head of the department of German in Yale. In return Professor Fairley of our German department visited Yale and Professor Brown of our English department visited Western Reserve University. It seems unnecessary to stress the value of this plan for keeping the members of our staff in touch with the work that is being done in similar institutions.

(3) THE ANNUAL REPORT OF THE DEAN OF THE FACULTY OF MEDICINE

(W. E. Gallie, M.D., F.R.C.S. Eng.)

The many letters received from graduates who have read recent annual reports from the Faculty of Medicine have indicated clearly that the plan of issuing it in the form of a letter designed to keep them in touch with all the activities of the Faculty is much appreciated and should be continued. As in last year's report, therefore, the Dean will comment upon matters of general interest to the whole faculty, and the heads of the various departments will discuss those subjects, both scientific and administrative that have been of interest in their particular fields.

As indicated in the report of last year the Faculty Council has been much concerned with the increasing numbers of students who desire to register in this Faculty and with the low level of scholastic aptitude shown by many of them. As it is quite impossible to keep up the standard of clinical instruction in the three final years if the hospitals are overrun with students, all possible ways of keeping the numbers within reasonable limits have been considered and every suggestion studied which might lead to a selection of those who are most likely to be successful.

As this question of how many students shall be accepted and who they shall be is of the utmost importance to the Faculty and as a definite policy in regard to it has now been decided upon, it would seem that the time is ripe for a frank discussion of the subject with the graduates.

Twenty years ago, from seventy to a hundred freshmen who held the matriculation standing of that time were admitted from Ontario and the other provinces, with an occasional student from the United States and other foreign countries. By the time they graduated the numbers had usually diminished by ten per cent. Then came the Rockefeller report on medical education and the almost immediate closing of hundreds of medical schools on this continent and the enormous raising of standards of both premedical and medical education. In Toronto the matriculation was raised from the pass to the honour standing and the medical course was lengthened first from four to five years and then to six. Many schools have required that students entering medicine shall hold a degree in the natural sciences, but so far we have not insisted on this but have attempted in a six year course to give the student an adequate training in the medical sciences and a slight contact with some of the purely cultural arts subjects. With this changing of the curriculum has come an enormous improvement in the courses given in both the preclinical and the clinical years, so that our Faculty has been able to reach and to maintain a position, as indicated by the Rockefeller reports, among the best schools on the continent.

Coincident with the sharp reduction of the number of schools and the general raising of the standards of medical education throughout America, many of the Schools abruptly reduced the number of freshmen accepted to 50 or 60, the number that could be handled satisfactorily in their associated hospitals. Naturally the selection committee picked out those applicants who appeared to be the best. I understand that nowadays such Schools as Western Reserve, Rochester and Buffalo select 50 or 60 freshmen from nearly a thousand applicants who hold their entrance qualifications and the result has been that we have

been finding it increasingly difficult to compete with these Schools in the average of the intelligence of the students.

With this great general reduction in the opportunity for registration there has been a steadily increasing pressure for admission to Toronto and some years ago it became necessary to increase the restrictions. Bearing in mind that this Faculty is supported by the Province of Ontario, these restrictions have not yet been applied to its citizens. They have, however, been applied stringently to the citizens of other countries and to a lesser degree to citizens of our sister provinces. Thus each year we have approximately five hundred applications from Americans who cannot get into the Grade A schools at home, and these are all declined. There are a certain number of applications from sons and daughters of our own graduates who live in the United States or elsewhere and from these we select only those who show aptitude for a prolonged course of study. This has caused some resentment on the part of some of our graduates but we hope that they will appreciate the great changes that have developed since their day and accept the general principle that this Faculty must serve primarily the citizens of Ontario.

Besides providing educational opportunity for young men and women from this Province, we must also lend assistance to the other provinces, particularly those who have no medical schools. In the case of British Columbia and New Brunswick, which have no medical schools, we accept graduates in arts who have covered the natural sciences and also students who have taken the first two years of that course. Such students are accepted into our second year if their academic record indicates that they may be expected to make satisfactory progress. With the University of Alberta we have an agreement by which students in either school may transfer to the other, provided all subjects in the previous year have been completed. The University of Saskatchewan has a course which coincides fairly well with our preclinical years. It is a four year course leading to a B.Sc. or a B.A. degree. We accept such graduates into our fourth year if their records are satisfactory. We also accept into our second year some students from Saskatchewan and Western Ontario who have completed satisfactorily their first two years, provided the number registered in our second year is not already excessive. In the case of St. Francis Xavier and Acadia Universities in Nova Scotia, and McMaster and Ottawa in Ontario, we accept into our second year graduates or students who have completed courses equivalent to our first year. From Alberta, Manitoba, McGill, Dalhousie and Queen's we consider applications for admission to the next higher year at Toronto provided equivalent courses have been completed and the applicant's record has been without stain, failures or poor reports from his school.

Before the period of overcrowding of our medical schools began, the previous record and aptitude of applicants from other Universities and provinces were not considered very carefully, but for the past few years this has had to be changed and now no students are accepted from outside Ontario who cannot be classified as good students. They always may be found in the upper third of the class.

But in spite of these restrictions, lengthenings of the course and general raising of standards, the overcrowding has continued. Three years ago there were 450 students in the three clinical years. This is an intolerable condition from many standpoints but from two in particular. First, it is difficult if not impossible in a city of the size of Toronto to give an adequate training in the principles of medicine, surgery and obstetrics to 450 students. Secondly, it is not fair to the patients in our public wards to force them to submit to continual use as clinical material for teaching. The Faculty determined, therefore, that in some way or other the number of students in the clinical years must be reduced to approximately 100 in each year.

In examining the plan of selection of freshmen in the Class A Schools in the United States and in such Canadian Schools as McGill, Queen's, Western Ontario, and Manitoba, we found the method simple. Each school has a definite limit

to the number of freshmen who will be accepted, usually between 25 and 75, and from the mass of applications the requisite number of the brightest students are selected. The choice is based on previous scholastic record, recommendation by head masters of schools, personal interview and standing in the so-called "Scholastic Aptitude Test" concerning which something will be said later. This method could not be adopted in the University of Toronto, however, as here we have a definite matriculation standard which gives any Ontario student who has it, no matter how long he took to obtain it, the right to register.

In searching for other plans of selecting students a study of the whole scholastic and academic records of large groups was made by the assistant dean, Dr. E. S. Ryerson. This showed conclusively that students with poor records in high school and in arts courses almost invariably did badly throughout their medical course and that students who had failures in their freshman year almost always had failures in subsequent years and either failed to graduate or did so only after repetition of whole courses of study. It was determined, therefore, that while no limit could be placed on the number of students from Ontario who might wish to register in the freshman year (provided they had their senior matriculation), it would be wise to allow only those to advance to the second year who had shown aptitude for medical studies. It must be agreed that the kindest way to deal with the poor student and his parents is to drop him at the earliest possible moment from a course of study for which he has no aptitude.

As indicated above the freshman year is really a premedical year during which the student studies in lecture hall and laboratory the fundamental sciences, physics, chemistry and biology. In addition he elects one arts subject, usually French or German and he attends a course of lectures on the history of science and civilisation. It is a full year and forms an excellent educational basis for the medical course.

The first step in developing a plan of selection consisted of raising the passing standard of the first year in the three sciences. Previously a mark of 50% in each subject constituted a pass. This has been changed in that while 50% is still the passing mark in each subject, an average of 60% must be obtained in the total of the three sciences. No supplemental examinations are allowed in these three subjects. While this does not appear to be an important change, it nevertheless reduced the number with a clear pass to a level that could be handled in the clinical years. We were annoyed to find, however, that the following autumn most of those who had been ploughed returned for re-registration in the first year in spite of strong advice to the contrary, and as there was no way of preventing this re-registration, the first year was larger than ever. As might be expected, these repeaters nearly all scraped through in the following spring examination, for only mental defectives could fail to pass this examination after two whole years of preparation for it.

This experience demonstrated that nothing short of strict methods of selection could be effective and it was accordingly determined to add to the existing regulations that students who failed in their first year examination could not re-register in the first year. This regulation comes into force this year and it should do something towards reducing the number of students to a level where each can expect to receive adequate training and where the general standard of intelligence will be equal to the work for which they are to be trained.

This final step in establishing methods of selection was taken only after grave consideration and with full realisation that occasional mistakes might be made in dropping from the Faculty students who might ultimately have achieved success in their studies and practice. To reduce this chance to a minimum, a system of recording the term work has been established and a series of test examinations introduced in order that the instructors may acquire early some knowledge of the application and ability of the students. When the results of the final examinations are considered, the whole record of those students who have failed, throughout high school and medical college, is reviewed and every

effort made to eliminate mistakes. To lessen the hardship to those who have failed simply because they had selected the wrong course, the way is still open for them to register in the first year in any other course in the University, or, if they have obtained a 50% standing in the subjects of the freshman year in medicine, to apply for admission to the second year of the pass arts course.

In determining the fate of borderline students, the Scholastic Aptitude Test of the Association of American Medical Colleges is likely to prove helpful. This test is applied to applicants for admission to most Class A American Medical Schools, during their premedical years in college. Last year we submitted our first year to the test early in December and were much interested to find that the standing obtained by the students in this very general test of intelligence, memory, powers of observation, general information, and so on, agreed very closely with students' records throughout the year and at the final examination. The test should be useful, therefore, in helping us to make the best selections for promotion to the second year.

Two years ago a committee of the Faculty was appointed to study the whole medical curriculum and to recommend whatever changes might lead to its improvement. At the end of the first year of the study the committee reported on the curriculum of the first, second and third years and recommended a general reduction of the number of hours devoted to both laboratories and lectures. They formed the opinion that with the passage of time, the various departments had tended to introduce much that was of special and advanced character into their courses and had forgotten that for the average medical student a firm grasp of principles is what is desired. In the view of the committee the objects of the whole preclinical period of a medical curriculum ought to be (1) to introduce the student to scientific method and to imbue him with the scientific habit of mind, (2) to induce in him correct habits of learning and the faculty of independent inquiry, and (3) of course, to equip him with such a body of fully assimilated scientific information as will form an adequate and enduring basis for his later, more purely professional studies. Each department has sought to elaborate its courses to the fullest possible extent, and with this object has sought the largest attainable share of the student's time. The result is that the curriculum has become overloaded in content, and overcrowded in time. The student has no time for individual study and reading—no encouragement therefore to teach himself. His one duty he feels, and is practically made to feel, is to commit to memory a certain mass of information; and, having discharged this at an examination, to replace it as completely as possible by another. The Faculty is convinced that the results of this system are not good and that a general reduction of the time devoted to lectures and laboratory classes would probably produce an improvement. The remedy is not simple.

One of the most important changes has been made at the request of the professor of pathology, Dr. Wm. Boyd. Hitherto, pathology has been taught in the fourth and fifth years synchronising with the clinical teaching, but according to the new plan it has been moved back into the third and fourth years. This was made possible by the reduction of the time devoted to chemistry, physiology and anatomy and it has the great advantage that when the student commences his clinical work at the beginning of the fourth year, he has some knowledge of the principles of pathology and when he enters the fifth year, which is the year of intensive study of disease, he has already covered the special pathology of those diseases.

This year the Committee on Curriculum completed its study of the three clinical years and made the same criticism as in the report on the primary years, that while the courses have been, on the whole, of excellent quality, some of them have been over-elaborated so that the student, busy in the acquisition of a mass of detail, loses sight of the principles of the subject and of its real place in the science and art of medicine. The changes recommended and adopted were as follows:—

1. *Bacteriology* (third year)—A reduction from 165 hours to 120 hours, a change that partly balances the introduction of 45 hours of pathology in the third year.
2. *Pathological Chemistry:* A reduction of the laboratory course from 60 hours to 40 hours. The lecture course will be of the same length but will begin in the third trimester of the fourth year and be completed in the first trimester of the fifth year. This change has two advantages; first, that it correlates more closely the lectures with the laboratory work, and second, it relieves to a certain extent the already overcrowded fifth year. This change will facilitate the student beginning the clinical study of certain types of cases in the department of medicine in the third trimester of the fourth year instead of the beginning of the fifth year.
3. *Radiology:* A reduction of the number of didactic lectures from 40 to 30 hrs.
4. *Obstetrics:* In this subject the most important changes have been introduced. Last year the didactic course on normal obstetrics was moved back into the fourth year and the timetable so planned that all didactic work would be completed by the end of the fifth year. At the same time arrangements were made with St. Michael's and the Western Hospitals whereby each fifth year student will have five weeks intensive practical training in one of these hospitals. During this period he will either live in hospital or be on call continuously. He will be excused from all other work except afternoon lectures. In the sixth year he will again have five weeks practical training in obstetrics and gynaecology, during part of which time he will live in the General Hospital and take part in the routine work as in general practice. This very great increase in the practical training in obstetrics should remove what has hitherto been a serious weakness in our course.
5. *Physical Therapy:* The increasing popularity of various empirical forms of physiotherapy led the committee to recommend greater attention to the teaching of this subject. Under the direction of Dr. W. J. Gardiner in the department of therapeutics, the teaching of physiotherapy has been established on a scientific basis and each student is given an opportunity to acquire both theoretical and practical training in the essentials.

The work of the Committee on Curriculum has proven so valuable that the Faculty decided to continue it for another year with the idea that it might investigate the schedule for each year as a unit, in contrast with the former approach from the departmental standpoint, and also that it might define along broad lines the objectives to be kept in view in the basic medical sciences and the clinical divisions of the course as a whole.

The summer courses for volunteer students from the sixth year was continued in surgery and obstetrics and again proved very successful. These students were distributed among the various services as externs and received a practical training very similar to that of a hospital intern. When the trimester comes in the regular term, during which they should be studying the subject covered during the summer, special appointments will be given to them in work in which they feel weak or in which they are specially interested. Thus, two will have appointments as externs at the Hospital for Sick Children, one at the Emergency Department of the General Hospital, one in the Urological Department and one on the Cancer Wards.

Accounts of the many important researches at present being conducted in this Faculty will be found in the reports of the various departments. Some of these are of the utmost importance and indicate that this University holds a strong position among the great centres of learning.

The outstanding medical contribution of the year came in response to the challenge of the epidemic of infantile paralysis which swept through Toronto and Ontario last Autumn. The whole staff of the Hospital for Sick Children rose to this emergency and in conjunction with the Departments of Health of the Province and City did excellent work in the diagnosis and treatment of

the disease. The size of the epidemic made it possible to observe in large numbers of cases the effect of convalescent serum. The consensus of opinion was that it was of no value. The suggestion, supported by experimental evidence on monkeys, that spraying the olfactory mucous membrane with zinc sulphate solution would prevent infection with the virus of the disease was tested out in a mass experiment on 5000 children. A study of the results showed that the method as carried out was of no value.

A feature of the epidemic was the surprising number of adults that were affected. This presented an emergency at the General Hospital which was ably handled by the medical staff.

In both the children and the adults a very high percentage showed involvement of the muscles of respiration and to meet the situation the mechanical department at the Children's Hospital supplied large numbers of Drinker respirators which proved of great value to both children and adults.

The postgraduate courses on manipulation therapy, cardiovascular diseases and fractures, held in the latter part of September, were well attended and successfully carried out. This year the courses will be on metabolic and endocrine disorders and on cancer. These short courses of one week of intensive study of special branches of medicine and surgery are proving very attractive to the graduates of both this School and others and will be continued as a part of the regular University work.

This year the Donald C. Balfour Lecture was delivered on Lister Day by Mr. Gordon-Taylor of Middlesex Hospital in London, England. His subject was "Gastric Haemorrhage". Mr. Gordon Taylor made the journey from England specially to give this lecture and so brought to fruition the founder's hope that in this lectureship our students might, from time to time, have an opportunity to hear distinguished surgical teachers from abroad.

The practice of inviting the Charles Mickle Fellow to deliver a lecture to the students and Faculty has proven very successful and has given us an opportunity to meet intimately the most distinguished practical research workers of their time. Last year we had a most interesting lecture from Dr. Donald D. Van Slyke on "Neutrality regulation of the Organism". This year the award has been made to Dr. George Hoyt Whipple of the University of Rochester for his work on pigment metabolism and regeneration of haemoglobin.

Well deserved honour has come this year to Professor C. H. Best, Head of the Department of Physiology, who was elected a Fellow of the Royal Society of England. Dr. Gordon Murray of the Department of Surgery has been much honoured also in his appointment as an Hunterian Professor in the Royal College of Surgeons of England for his work on "Heparin".

I regret to have to record the death of a member of the Faculty, Dr. George R. Pirie, of Dr. George C. McIntyre, a former teacher in the department of surgery, and of Dr. E. A. Gray, the medical superintendent at the Toronto General Hospital.

Doctor Pirie was a distinguished member of the medical staff of the Hospital for Sick Children and an excellent teacher of paediatrics. Dr. McIntyre was an exceedingly popular young surgeon whose retirement some years ago because of ill health was regretted by all. Doctor Gray was known to all interns and students and was a valued friend of the University.

(4) REPORT OF THE DEAN OF THE FACULTY OF APPLIED SCIENCE AND ENGINEERING

(C. H. Mitchell, C.B., C.M.G., C.E., D.Eng.)

The past session has been noteworthy in this Faculty because of the steady and serious application to work by the students, with their consequent excellent academic results.

Notwithstanding the general unrest which is abroad, and the apparent unconcern and inattention of present-day youth to serious things, the young men of this Faculty appear to have successfully resisted the slackness which seems to so generally prevail. This has been observable both in their academic work and their student activities, and is a tribute not only to their own determination and judgment, but, I believe, to the faculty staff as well, in its special efforts to meet these prevailing conditions.

The number of students in attendance continues to increase. The upswing which recently became apparent has now definitely developed and is a natural result of the recovery of general conditions and activities in the country following the conclusion of the depression, the low point of which was reflected by the number (766) registered in this Faculty in 1935. Since then there has been a distinct rate of increase, there being 789 in 1936 and 833 in 1937. A similar rate of increase will doubtless now continue for a time.

The present "recession", as it has been called, has noticeably affected the activities of industry and some fields of engineering in this country the past year, and this may temporarily influence the attendance in certain of the engineering courses. In the long view, however, it is reasonable to expect a still greater attendance in this Faculty in the next few years. This is desirable because the country still needs young engineers—highly and carefully educated technical and technical-business men.

It is worthy of record at this time, and with respect to the foregoing, that in the past few years the number of young men taking applied science courses in this Faculty who go out into business and work other than engineering, has steadily been increasing. Whereas ten years ago only a small percentage of applied science graduates did this, there are now many more who do so immediately upon graduation. More than ever do young men come for applied science courses who never intend to follow engineering. In the usual course of graduates' progress, it has been noticeable, moreover, that the percentage of those who have been out five and ten years, who have departed from purely professional work and gone into the business side, has very much increased and continues to do so. Engineering graduates from this Faculty are now to be found in large numbers in executive positions in very many industries where they are more concerned with finance, economic, and commercial operations than with technical. A great many have also gone on into banking, finance, law, and purely commercial enterprises, a number into teaching, and some into church and foreign missionary work.

The relative distribution of numbers of students into the various graduating departments is now regaining a proportion more appropriate to the country's probable needs. Those in civil engineering are definitely increasing, which is desirable, as a shortage of young men in this important branch of the profession has already been manifested. The numbers entering mechanical engineering should also increase in proportion, as there is always a strong demand in this field and it will continue. The result of the small numbers which have been entering architecture, a five-year course, now begins to be felt in a distinct shortage, and this will be accentuated with the impetus given the construction industry by the new legislation.

A study of the results of examinations in this Faculty over a period of time, say ten years, discloses several interesting features with respect to the number of students entering and the failures in the first and succeeding years. Emerging from such study, the following observations may be made:—

(1) That when students crowd into a faculty or course, the ratio of failure tends to increase, a natural consequence of attraction to such a course by a greater number of students of diverse abilities.

(2) That ratios of failures in the first year were high in 1931 and again in 1935 and 1936, the former being with a large number in the year on the entrance of the depression, and the latter on its approaching exit, with a hundred

students less, but with the first full effect of the operation of the "recommending" process of entrance to the University.

(3) That in the past two years the first year failures have declined, and

(4) That in the past two years the failures in the second, third, and fourth years have also noticeably declined, and for this year it is pleasing to note an increased percentage taking honours, especially in the first two years.

This session the first group of students taking the course in engineering physics established four years ago completed their fourth year, six in number, and graduate this spring. While this is a difficult course, requiring high attainment especially in mathematics, it appears to have attracted a fair number of students, there having been passed this session twelve in the first, ten in the second, and six in the third years.

The course in mining geology, established a year ago, which combines the first two years of mining engineering with the last two devoted mainly to geology and kindred subjects, has already attracted a few students, there having been, this session, seven in the first, one in the second, and two in the third years.

The provision of increased building accommodation is still the outstanding necessity in this Faculty. Hopes have long been entertained that additional facilities could be provided, especially for mechanical and chemical engineering. As each year passes, difficulties, due to lack of space and appropriate equipment, become more acute.

In mechanical engineering the scope and further development of instruction in newer directions is being seriously hindered due to lack of or delay in providing these facilities. The phases of expansion greatly desired, and indeed necessary if the University is to even reasonably keep pace with growing requirements in this field, lie in new laboratories for machine design and open channel hydraulics, and in means of conducting experimental studies by models of river channels and harbours. These latter have now become of great importance with respect to flood control and the resulting property damage. Additional provision is greatly needed for expansion of facilities for instruction and experimental study regarding heat insulation, a subject now much to the front in this country.

In chemical engineering, the necessity of providing increased accommodation has rapidly become more urgent. During the past few years the crowded condition of laboratories in this department, due to greatly increased numbers of students, has become steadily worse. Not only does this crowded condition seriously obstruct the normal courses of instruction, but it makes almost impossible the installation of new and much needed equipment, even if the requisite funds for such were forthcoming.

Each succeeding session, the increasing numbers of students moving up into higher years in chemical engineering have very greatly added to difficulties of instruction and have limited its scope. Attention has been drawn to this condition each of the past eight years or more as the members of the staff and the students of this Faculty and department have continuously experienced these conditions becoming more acute, notwithstanding all the efforts, devices, and makeshifts which both staff and students have continued to keep necessary instruction going. These conditions can, in the end, have only one result, even apart from the discouragements which ensue. The efficiency must suffer. Attention has frequently been called to this possibility, almost yearly, having been first reported in 1930.

It is with great regret that, now, after every means appears to have been exhausted, the department of chemical engineering, contemplating the very large classes coming into their third and fourth years, all members needing specific personal facilities, reports that in the forthcoming session the efficiency of instruction will definitely and seriously be impaired. This is most unfortunate in such an important field of education.

Accommodation for metallurgical engineering is now being taxed in a manner that threatens results similar to those already described. This depart-

ment was provided with accommodation in its earlier days for not more than thirty or forty students in all years. An endeavour is now being made to compress into the same space over twice this number—there being eighty students the past session, and nearly a hundred coming next year. These figures apply only to those registered in the department, and have no relation to the large numbers in others which this department also serves.

Research in this Faculty has proceeded as usual during the past session, although under great restriction, due to lack of funds with which to prosecute most desirable researches. The Committee of Management of the School of Engineering Research has held many meetings, particularly during the past term, and as a result its structure has been considerably improved, with its membership doubled and its operations provided for by more comprehensive arrangements. Its report on the work of the session is presented separately, but concurrently with this.

It will be observed that thirty-five researches have been carried on by thirty-four different researchers, including professors, lecturers, instructors, and specially appointed research assistants. These researches are all carried out in applied science fields directed towards objectives which are hoped to be of specific use in various industries, with which the work in this Faculty is concerned. While all this research effort has produced a degree of satisfaction on the part of the School of Engineering Research and the members of the staff, there is much more to be desired if funds and opportunity in point of available time on the part of the researchers were available. A difficulty encountered in this respect in this Faculty is that the normal and routine work of instruction absorbs so much of the time of the staff during the session that their efforts are limited, and after the session is ended there is but a short time left before this report of the year's work requires to be presented. Many researchers work steadily throughout most of the summer holidays as a consequence.

In the retirement of Professor H. E. T. Haultain at the end of this session, this Faculty loses a most valuable member. Professor Haultain has been head of the department of mining engineering for the past thirty years, since he first came onto the staff. His great ability as a teacher and administrator has resulted in building up a department of which the University and the Province may well be proud. His close contact with the mining profession and the industry generally, and the foundations he has laid in this respect, have been of the greatest value. His efforts and his long and painstaking work in connection with the provision of the new mining mill in 1930 will long be remembered. Perhaps, however, Professor Haultain's greatest contribution has been in his deep interest in the young men going through his department and his concern for them after graduation; this after all is one of the finest attributes upon which a university professor can be congratulated.

(5) REPORT OF THE DEAN OF THE ONTARIO COLLEGE OF EDUCATION

(Dr. J. G. Althouse)

Registration in the Ontario College of Education was slightly lower than in the previous session. Including extramural students the total number of registered was 628, as against 653 in 1936-37. The decrease occurred mainly in the High School Assistants' course, but the proportion of students in this course seeking specialist standing continues to increase.

The current revision of the High School courses of study necessitated the establishment of two new supplementary courses for teachers: home economics and shop work. The supplementary course in music again attracted a large

group of students, and the class for Intermediate Certificates in home economics was much larger than usual. On the other hand, the enrolment in physical education and in the public school course was reduced.

The Librarians' course continues to attract classes to the capacity of the school. A revision of the course of training, which has been in process for some time, was greatly accelerated by the decision of the Board of Governors to add a full-time instructor to the staff. The course now devotes approximately one-third of the time to basic technical knowledge and skills, one-third to knowledge of books, and one-third to special lectures and administrative problems.

During the year the Department of Educational Research published Bulletin No. 10, *Bibliography of Canadian Education*. Two forms of a World Geography test were published for use in the elementary school, and two intelligence tests, one for high school grades and the other for the middle grades of the elementary school, were made ready for standardisation. Preliminary work was done on an achievement test in French. Several minor researches were carried out: a study of grades awarded by critic teachers to teachers-in-training; the influence of economic factors on student-teacher enrolment; the reliability of test-item validities. Members of this department participated in a Dominion-wide conference on national research in education, in preparation for the biennial meeting of the Canadian Educational Association.

Mr. G. A. Cline's continued ill-health prevented him from assuming his duties throughout the entire session.

The Board of Governors made the following additions to the staff:

Miss Mary E. Silverthorn, M.A., Assistant Professor of Library Science in the Carnegie Library School at Pittsburgh, to be assistant professor of library science in the College of Education;

Miss Ruth E. Ratz, B.A., head of the department of home economics in Jarvis Collegiate Institute, Toronto, to be lecturer in home economics in the College of Education.

(6) REPORT OF THE SECRETARY OF THE FACULTY OF HOUSEHOLD SCIENCE

(Professor C. C. Benson)

The work of the Faculty of Household Science has proceeded much as usual this session.

The registration has been about the same as last year, with the majority of the students coming to us from Macdonald Institute, and a few from other universities. With the present entrance requirements and arrangements of courses, it is undoubtedly wiser for most of the students who wish to study Household Science and who come to the university from the secondary schools of the province, to take their work in the Faculty of Arts and to graduate from the course in household economics. In that course, the increase of household science work in the schools has already shown a larger number in attendance here, but the registration in this Faculty is not likely to greatly increase for the present. We are, however, glad to be able to offer opportunity to obtain a household science degree to graduates of Macdonald Institute, and to others from other colleges and universities.

There have been requests during the session for an arrangement for extension work, but as yet it has not seemed advisable to undertake this. The numbers wishing such work are small and the cost would be considerable, but it may be necessary to arrange for summer courses in the future.

(7) REPORT OF THE DEAN OF THE FACULTY OF FORESTRY

(Dr. C. D. Howe)

This years graduates from the Faculty of Forestry, six in number, have all found positions, four in governmental services and two with pulp and paper companies. Nearly ninety per cent of the undergraduates who passed their examinations are employed in forestry work for the summer, being divided about equally between the Government and private companies. The so called recession in the business uptake in the United States has reflected itself adversely on the pulp and paper industry in this country and so on the employment of forestry graduates compared with the conditions a year ago when the Faculty could not supply the demand from the industry. The present situation is undoubtedly a temporary condition in the industry and the former demand for graduates will be restored. The demand for foresters in the governmental services is slowly increasing.

The two new courses introduced into the curriculum last year, namely the course on fish and game conservation and the one on the scaling of timber, the latter given at the Forestry camp, have been carried on with increasing success during the current year.

We had occasion to make a statistical study of our students' origin, pre-university education and employment after graduation, covering the first thirty years of the Faculty's existence. We found that since its establishment four four hundred and nine students registered in the Faculty. Of these seventy-seven per cent came from Ontario and nine per cent from the other provinces and Newfoundland. Outside of Ontario, New Brunswick has contributed seven students and six each have come from British Columbia, Manitoba and Quebec. Five came from Alberta. Nova Scotia has furnished four, Saskatchewan two, and Prince Edward Island and Newfoundland one each. Fifty-seven students, fourteen per cent of the whole number, have come from other countries among which Great Britain and possessions lead with twenty-two men, followed by the United States, Holland, Finland and Norway.

Around forty-four per cent of the three hundred and nineteen students from Ontario came from Toronto and this city has contributed a little more than a third of the students as a whole. The Parkdale Collegiate made the largest contribution to the Faculty, twenty-five men. Jarvis and North Toronto stand next with seventeen and sixteen men respectively. Humberside Collegiate furnished thirteen, Riverdale and the University of Toronto Schools eleven each. Nine of the entrants came from Harbord, seven from Oakwood, five from Malvern, and four each from Bloor and West Toronto Collegiates. The Central Technical School furnished three men. Among the private schools in the city, Upper Canada College leads with eight men, St. Clements contributed two, St. Michael's and De la Salle one each.

It is a significant fact that the Toronto schools furnishing the largest number of men to the Faculty are those that have had principals or science masters with more than the usual interest in the conservation of our natural resources.

Other towns than Toronto in Ontario have contributed one hundred and seventy-seven men representing seventy-six different preparatory schools. Forty-five of these, however, sent only one man each to the Faculty during the past thirty years. Ottawa leads with twelve men. Aurora, Clinton, Kitchener, London and Sault Ste. Marie furnished five men each while Belleville, Brampton, Galt, Hamilton, Peterboro and Woodstock contributed four men apiece.

Of the four hundred and nine men who began the study of forestry in the past thirty years, only two hundred and fifty eight, or sixty-three per cent, completed the course and received degrees. Failure to meet the academic requirements was the chief cause of the men dropping out. Comparing the number entering from Toronto with that from the Ontario towns outside of the

city, one can find practically no difference in the number completing the course in the two groups; it is less than one per cent in favor of Toronto.

The number of living graduates is two hundred and forty-four; of these one hundred and eighty-six or over seventy-six per cent are employed in forestry or related fields. Pulp and paper, lumbering and allied industries have absorbed nearly one half the forestry group. The various governmental forest services employ about one third of the remainder. In the next largest group, a little over ten per cent, are included the men who are working in forest entomology, forest pathology, nursery inspection and so forth in other governmental organisations and engaged in aerial patrol, timber estimating, and saw-milling for private companies. Eight of the graduates are teaching forestry in universities, four in this University and four in the United States, one each at the University of Michigan, the University of Washington (state), Purdue University in Indiana, and the New York State College of Forestry at Syracuse University.

Under the classification of pulp and paper, lumbering and allied industries, the distribution of the men is as follows: Ontario forty-seven, Quebec twenty-three, British Columbia six, Manitoba three, New Brunswick two, Newfoundland three, England one, and United States four—eighty nine men in all.

Ontario leads in the number of men in government forest service with thirty-three men. The Dominion Forest Service comes next with seventeen men. The Forest Branch of British Columbia has six of our graduates, Manitoba three, Saskatchewan two and Alberta one.

The figures given above are based on conditions in December 1937. The shiftings of the past six months have changed them somewhat but not in essential character.

(8) REPORT OF THE DEAN OF THE FACULTY OF MUSIC

(Sir Ernest MacMillan)

An important step has been taken this year in the appointment of Dr. Healey Willan and Mr. Leo Smith as professors in the Faculty of Music. The extension of musical activity in the University, particularly in connection with the new Arts Course, has rendered full time appointments necessary. As the appointments have been made with the support and co-operation of the Board of the Conservatory of Music, a closer relationship between the University and the Conservatory seems assured for future years.

Dr. H. A. Fricker, who has been a lecturer of the Faculty of Music since the Faculty was constituted in its prsent form in 1918, retires this year. His colleagues will greatly regret the loss of his valuable advice and co-operative spirit.

Eight students were registered in the new Music Course in the Faculty of Arts and indications point to an increased interest in this course in years to come. Instruction will be undertaken, as heretofore, by members of the Faculty of Music.

During the years 1937-38 the number of students registered for the Mus.B. degree was forty-nine. Eight of these were registered in the first year, sixteen in the second, and twenty-five in the third. The degree of Bachelor of Music was conferred on nine students. No doctorates in music were conferred. The usual series of lectures have been given by members of the Faculty and fourteen students were registered for special tutorial classes.

Four organ recitals have been given in Convocation Hall, arranged by Dr. Healey Willan: one each by Mr. David Ouchterlony, Mr. Maitland Farmer, Dr. Charles Peaker, and Mr. Frederick Silvester.

Early in the autumn, the Carnegie Corporation of New York, at the request of the President of the University and the Conservatory Board, asked Mr. Ernest Hutcheson of the Juilliard Foundation to undertake a survey of the

activities of the Toronto Conservatory of Music, and in the light of his experience of similar institutions, to make suggestions which might further the interests of the Conservatory. In spite of the short time at his disposal, Mr. Hutcheson was able to cover a great deal of ground and his report has been of notable value in suggesting direction of future activities. The division of the functions of the Conservatory into three categories has become somewhat clarified:

(1) Training school for professional musicians.
(2) General public school of music.
(3) A public academic body closely connected with the University and exercising an important influence in the general musical life of the community through its examination system and otherwise.

While no drastic changes are contemplated for the present, it is probable that in the course of time these functions will be more sharply differentiated. In the meantime a Summer School has been announced, to be held in July, 1938, and during the coming year courses for full time professional students of the Conservatory are being planned on a broader basis than heretofore in order to establish a definite Senior School.

The sale of the Academy property on Spadina Road should result in easing somewhat the financial problems of the institution and in enabling a greater degree of concentration of its activities.

The Conservatory Choir has appeared in Convocation Hall in the annual performance of Bach's "Saint Matthew Passion" on April 12, and has also sung Mendelssohn's "Elijah" and extracts from Act III of Wagner's "Parsifal" and from Act III of "Die Meistersinger" in Massey Hall with the Toronto Symphony Orchestra. The Choir sang also Pierne's "The Children's Crusade" with the Philadelphia Symphony Orchestra in Massey Hall in May. The Conservatory Orchestra, under the direction of Mr. Ettore Mazzoleni, appeared twice in Massey Hall, and twice in Convocation Hall. Other Conservatory organisations, notably the Conservatory String Quartet, have made valuable contributions to the musical season in Toronto. A new Chamber Music Club formed in the early fall has already attracted a large membership.

At the end of May, 1938, registration for tuition at the Toronto Conservatory of Music showed an increase of nearly three hundred over figures for the previous year. The number of candidates for examinations for the present season has been 13,482.

The musical activities of Hart House have been as extensive as ever and the Hart House Glee Club, under Dr. Charles Peaker, continues to progress. It has been decided to concentrate the Carillon recitals from the Memorial Tower, by J. L. Richardson, into a shorter season in order to enable a larger number to enjoy them during the warmer months.

(9) REPORT OF THE DEAN OF THE SCHOOL OF GRADUATE STUDIES

(Professor G. S. Brett)

The number of students registered in the School of Graduate Studies for the year 1937-8 was 583. As compared with the enrolment for 1936-7 this is equivalent to a decrease of 54. The number registered for the Ph.D. was 118, as compared with 134 in the previous year: for the M.A. the number was 173, an increase of 33 over the previous total. The significance of these figures is made uncertain by the fact that students who are in reality proceeding to the M.A. may be registered as graduate students: a total of 205 students were so registered in the current year. The number of men enrolled was 432, showing a decrease of 32 from the previous year: the number of women increased from 137 to 151. It is possible that the decrease in the total enrolment reflects the

effect of raising the fees. The decrease of candidates for the D.Paed. accounts for 46 out of the total 54, which shows that the fluctuations in the other subjects was not great.

The number of students resident in the Province of Ontario was 421, a decrease of 51; the number from Toronto was 259 (a decrease of 43) and from the other parts of the Province 162 (a decrease of 8). (For detailed distribution see Appendix B (K).) The number of students from other Provinces of Canada was as follows:—Quebec 6, Manitoba 28, Saskatchewan 23, Alberta 11, British Columbia 12, New Brunswick 14, Nova Scotia 17. The number from other countries increased from 48 to 51, distributed as follows: Great Britain 2, China 9, Japan 1, Bahamas 1, India 2, Newfoundland 1, Ireland 1, Switzerland 1, Germany 1, U.S.A. 32.

The number of institutions represented in the School was 59. This number includes 17 Canadian institutions, 26 institutions in the United States, 4 English and 12 situated in other countries. The number of students from universities in Ontario other than Toronto was 83, including 31 from McMaster, 27 from Queen's and 25 from Western Ontario. The number of students who had taken their first degree at Toronto was 335.

The distribution of the candidates for the different degrees was as follows:—

Ph.D.	118
M.A.	173
M.S.	3
M.A.Sc.	12
C.E.	1
Mech.E.	1
D.Paed.	46
M.Sc.(Dent.)	1
M.S.A.	20
Mus. Doc.	3

The distribution of the candidates according to the major subject was:—Anatomy 1, anthropology 5, applied mathematics 5, architecture 1, biochemistry 13, biology 30, botany 21, chemistry 40, chemical engineering 10, Chinese archaeology 3, civil engineering 2, classics 18, dentistry 1, educational theory 2, electrical engineering 2, English 53, food chemistry 3, geography 2, geology and palaeontology 15, Germanic languages and literature 8, history 31, household science 3, hygiene and preventive medicine 4, law 4, mathematics 10, mechanical engineering 5, mineralogy 3, music 3, pathological chemistry 4, pedagogy 46, pharmacology 3, philosophy 59, physics 36, physiology 9, physiological hygiene 3, political science and economics 23, preventive dentistry 2, professional degrees 2, psychiatry 1, psychology 39, romance languages 27, semitics 8, surgery 3, special committees 20.

The number of students recommended for degrees was:—

Ph.D.	35
M.A.	117
M.S.	2
M.A.Sc.	4
C.E.	1
E.E.	1
D.Paed.	1
M.S.A.	9
D.V.Sc.	2

Fellowships:—Nine Open Fellowships and Scholarships were awarded by the Council of the School on the recommendation of the Scholarship Committee. Other awards, noted below, were made by the Council on the recommendation of the departments or committees concerned.

F. E. L. Priestley, M.A. Alberta, department of English.

Miss M. B. Ellis, M.A. British Columbia, department of romance languages.

A. F. Graham, B.A.Sc. Toronto, department of chemistry.

L. H. Turl, B.A. Toronto, department of physics.

W. Robbins, M.A. British Columbia, department of English.

M. Long, M.A. Toronto, department of philosophy.
W. Paterson, B.A. Manitoba, department of history.
B. M. Springbett, B.A. Alberta, department of philosophy.
Miss M. E. Biehn, B.A. Queen's, department of biochemistry.

Alexander Mackenzie Fellowships:—
W. B. Ross, B.A. Dalhousie, B.A. Oxford, department of history.
D. D. W. Irwin, B.A. Manitoba, department of political science.

Ramsay Wright Scholarship:—
Miss G. W. Workman, B.A. Toronto.

George Paxton Young Fellowship:—
J. G. L. Pearson, B.A. Toronto.

Nipissing Mining Company Research Fellowship:—
D. A. J. McDonald, B.A.Sc. Toronto.

Fellowships tenable in the University of Toronto by students undertaking graduate research were awarded by the respective Committees of Award as follows:—

War Memorial Fellowships:—
E. E. Minett, B.A. Toronto.
J. O. Gorman, B.A.Sc. Toronto.

Maurice Cody Fellowship:—
F. J. Westcott, B.A. Brandon; department of political science.

A Fellowship of the value of $500. has been established for research in problems of personality. This fellowship, to be known as the John Northway Memorial Fellowship, will be awarded annually on the recommendation of the department of psychology. For the year 1938-9 the fellowship has been awarded to Miss M. L. Northway, Ph.D.

Staff Appointments: The number of graduate students holding positions as demonstrators or instructors during the session 1937-8 was 178.

(10) REPORT OF THE DEAN OF THE FACULTY OF DENTISTRY

(*Arnold D. Mason, D.D.S.*)

It is with regret that I report the passing of Dr. C. Angus Kennedy, associate professor of orthodontia, in July, 1937. His unexpected death was a great shock to me as well as the other members of the Faculty. Dr. Kennedy had given years of constructive service not only to the faculty and the dental library, but also in his associations with the general activities of the profession of dentistry. A suitable tablet is being erected to his memory by the Board of Directors of the Royal College of Dental Surgeons and the Ontario Dental Association.

One hundred and eighty-six students registered in the regular dental course this year, three of whom were young women. Twenty young women enrolled in the class in Dental Nursing. Four candidates were registered for the degree of B.Sc. (Dent.), and two of them were awarded the degree this year. In addition to the Ontario students, three students from the Western provinces were enrolled as well as one from New Brunswick and two from the United States. Six graduates from Australia attended the final year, and one graduate of Calcutta Dental College, India, was admitted to the fourth year.

During the year, four graduates attended for post-graduate instruction, one being from London, England, and one from Nova Scotia.

Eleven members of the Faculty have addressed dental associations in various phases of dentistry at twenty-two different centres throughout the province. The Board of the Royal College of Dental Surgeons assisted in the financing of this service to the profession, augmenting the university appropriation.

When Dr. Fulton Risdon was in Winnipeg in February in connection with the Medical Association, he addressed the Winnipeg Dental Society. Dr. Roy

Ellis on his way to Aklavik gave lectures and clinics to dental associations at Winnipeg, Saskatoon and Edmonton. When Dr. Frank M. Lott is returning from the Pacific Coast Dental Conference in July, he will speak to dental groups at Lethbridge, Calgary, Moose Jaw, Winnipeg, Port Arthur and Sault Ste. Marie.

The meeting of the American Association of Dental Schools was held at Minneapolis from March 14th to 16th. This faculty was represented by Dr. C. A. Corrigan and myself. En route we visited the faculties of dentistry in Chicago, as well as the dental faculty of the University of Minnesota.

As usual the dental library has been extensively used by the students and the members of the profession. Copies of most of the new dental publications have been purchased. The family of the late Dr. Albert E. Webster has kindly presented his personal library to this faculty. The stack room has been renovated and many duplicate copies of serial journals have been donated to other libraries.

The Graduate Consultation Service has been much appreciated by the profession and 178 dentists have availed themselves of this service during the past year.

Following last year's intensive study of the report of the Curriculum Survey Committee of the American Association of Dental Schools, a study was made of the methods of presenting dental techniques. This has brought closer co-operation and understanding between the teachers in the departments teaching various phases of dentistry, resulting in better instruction to the student. The rearranged time-table has adjusted the hours of teaching in this faculty to coincide with those in other departments of the University and has met with the universal approval of the staff and students.

I believe the feeling between the students and staff of this faculty is very cordial and that this harmonious relationship produces the best possible results.

(11) REPORT OF THE DIRECTOR OF THE SCHOOL OF HYGIENE

(J. G. FitzGerald, M.D., LL.D.)

The School of Hygiene was formally established in 1925, but complete organisation was not effected until two years later. That occasion was marked by the opening of the Hygiene Building in June 1927, funds for the building of which were provided by the Rockefeller Foundation. The demands which were likely to be made upon the School in providing instruction, graduate and undergraduate, in preventive medicine were of course unknown. Modest estimates were made of the accommodation which would probably be required for the School and for the University Section of Connaught Laboratories. Within three years it became manifest that the original building was entirely inadequate in size. So quickly did expansion occur that before the end of 1932 the building was extended to double its original size. The growth of the School and its associated unit, Connaught Laboratories, has amply demonstrated the wide field of service open to them in the Dominion of Canada. The School is now recognised not only as the centre of graduate teaching of public health in this country but also as a training centre for all the provinces and for students from other countries as well. This is the eleventh annual report of the School of Hygiene, and a brief review of some of the developments of the past decade may be recalled.

Since 1927, the number of medical graduates who have completed the course leading to the diploma in public health is 182. These have come from all Canadian provinces and from elsewhere. They are distributed as follows: Prince Edward Island, 1; Nova Scotia, 4; New Brunswick, 9; Quebec, 42; Ontario, 65; Manitoba, 15; Saskatchewan, 5; Alberta, 8; British Columbia, 15; elsewhere, 18. This large group of trained public health workers is now engaged in whole-time

service in the field of preventive medicine. This has made for vast improvement in the quality and scope of work undertaken in one of the most important of the social services.

For many years past the Rockefeller Foundation has aided governmental authorities in many parts of the world to obtain the services of properly trained persons through the provision of public health fellowships. These have enabled suitably qualified men and women to spend varying periods of study in the School of Hygiene and in similar institutions in other countries. In Canada this arrangement has been supplemented by the creation and award of Connaught Laboratories fellowships in public health. Reference to these has been made in the report of the Director of the Laboratories. Since 1927 no less than seventy-four Rockefeller Foundation and forty-one Connaught Laboratories fellowships have been granted.

This year there has again been an increase in the number of students proceeding to the Diploma in Public Health, the enrolment being greater than in any previous year.

The departments of the School, namely, hygiene and preventive medicine, epidemiology and biometrics, physiological hygiene and the sub-department of chemistry in relation to hygiene have during the session of 1937-1938 provided instruction for 423 students who were enrolled in the following courses:—

A.	*Graduates*	
	Candidates for Diploma in Public Health	18
	Candidates for the degree of Ph.D.	4
	Candidates for the degree of M.A.	3
	Occasional students	2
B.	School of Nursing	57
C.	*Undergraduates*	
	Faculty of Medicine, 5th year	136
	Faculty of Household Science, 2nd and 3rd years	31
	Faculty of Arts, 2nd and 3rd years	63
	Second-year Pharmacy	104
	Fourth-year Physical Training	5
		423

Students in the D.P.H. course came from Alberta (1), British Columbia (3), Manitoba (2), Ontario (2), Quebec (4), New Brunswick (1), Nova Scotia (1), United States (1), India (1), and China (2).

Many important investigations have been undertaken in the various departments of the School during the year. The lines of inquiry have been of two general sorts. In hygiene and preventive medicine the studies of certain aspects of infection and immunity in pneumonia, diphtheria, scarlet fever, etc., have been extended in various directions. Many of these undertakings have been carried on in collaboration with health departments in various parts of Canada. This approach to many outstanding problems of the specific prevention of disease has many advantages. It is frequently possible to ascertain facts of theoretical interest and importance while developing practical means of more effectively controlling certain communicable diseases. Despite the great advances of the last two or three decades the number of preventable deaths and the amount of invalidity reported yearly from such diseases as tuberculosis indicate how much remains to be accomplished. Patient, systematic and prolonged inquiry in the laboratory and in the field should in the years to come yield substantial returns. To that end much of the work in this School is directed.

In epidemiology and biometrics very valuable results have been secured in the fields of research which bear most pertinently upon the day-to-day problems of the health departments, federal, provincial and municipal, of this country. It is no exaggeration to state that the most stimulating and helpful agency in the promotion of improved public health methods and procedures is that provided

by Professor R. D. Defries and his colleagues and associates in their work in epidemiology and cognate branches.

In physiological and industrial hygiene much has been accomplished. In general the scope of activities may be defined as the study of certain physiological functions and the influence of various environmental factors upon them. Naturally attention is directed primarily to the study of those aspects of human physiology which may lead to a better understanding of the factors which maintain and promote health. In the present state of knowledge a most important field of research is that concerned with more exact definition of the normal. This may be approached by repeated, systematic and thorough examination of healthy persons for long periods of time. Just such work is being carried on in the School. Another avenue of approach, experimental rather than purely observational, is also occupying the attention of Professor Best and his colleagues in their studies in cardiology. Then again, the exceedingly important subject of nutrition is receiving more and more attention, and in this field Dr. E. W. McHenry and his group have made highly important additions to present knowledge. The work has been conducted in the laboratory under experimental conditions and dietary surveys have also been carried out in collaboration with other workers. The exceedingly important rôle which nutrition plays in the maintenance of sound health and full bodily vigour is coming more and more to be recognised as being supremely important for the individual and the state. Undernutrition and malnutrition are complex problems which, because of their economic and social aspects, are of very especial interest to those concerned in the promotion of physiological hygiene.

In industrial hygiene further work has been done by Dr. J. G. Cunningham and Dr. H. M. Barrett in the elucidation of health hazards in certain industries. Dr. Barrett and Mr. Johnston have also made a valuable contribution to knowledge of the probable mode of action of certain toxic agents which are widely employed.

The researches to which brief reference has here been made have, in the main, been supported by substantial grants from Connaught Laboratories. More detailed consideration of investigations which have been carried on in those Laboratories will be found in the report of the Director. Some work has of course been done partly in the School and partly in Connaught Laboratories where such an arrangement has been deemed desirable.

During the previous year the Director of the School was engaged in an extended study of the teaching of preventive medicine to medical students in various countries in Europe and North America. The work was undertaken on behalf of the Rockefeller Foundation. An endeavour was made to assertain the extent and character of preventive teaching in medicine at the present time. Altogether more than twenty-five countries were visited, and almost everywhere there is a clear appreciation of the significance of the preventive function of medicine. There appears also to be a determination to extend and improve facilities for suitable instruction of future medical practitioners in hygiene, public health and the preventive aspects of the various clinical branches. To facilitate and promote such efforts some of the great foundations in the United States are contributing very substantially.

The future progress of preventive medicine, as is now clearly realised, depends as much upon an enlightened and alert medical profession as it does upon organised community effort conducted by departments of health. Therefore the school or faculty of medicine has a role to play not second to that of the school of hygiene, in this and every other university, in affording the medical student every opportunity of familiarising himself with his duties, responsibilities and opportunities as a practitioner of preventive as well as of curative medicine.

Many visitors from various countries have visited the School during the year. They came from Belgium, Canada, Ceylon, China, England, France, India, Hungary, Jamaica, Japan, Korea, Panama, Roumania, Scotland, South

Africa, Sweden, the United States of America, and Yugoslavia. They have always been most welcome, and the interchange of information and opinions has been highly advantageous to members of the staff of the School.

To my colleague Professor R. D. Defries I am deeply indebted for discharging the duties of director during the session 1936-1937.

(12) REPORT OF THE LIBRARIAN

(W. S. Wallace, M.A.)

I beg to submit the following report on the work of the University Library for the year ending June 30, 1938.

The number of volumes added to the Library during the year has been 12,894; the number of pamphlets, 3,486; making the total number of accessioned volumes in the Library 352,155, and the total number of pamphlets, 135,395—or a grand total of 487,550.

The following are the statistics of the use of the Library by undergraduates, in comparison with previous years:

	1921-22	1926-27	1934-35	1936-37	1937-38
Reading-room books....	41,928	106,485	186,605	206,694	194,708
Overnight books.....	18,998	39,779	107,559	111,572	102,675
Week books.....	4,782	13,104	23,399	22,820	21,233
Totals.....	65,718	159,278	317,541	341,086	318,616

The following is a statement showing the circulation in the medical, political science, University College, and law reading-rooms, in comparison with other years:

	1934-35	1935-36	1936-37	1937-38
Medical reading-room:				
reading-room books.....	10,761	11,195	12,814	11,333
over-night books.....	11,386	12,219	12,425	10,072
week.....	3,606	3,622	4,188	3,069
Totals.....	25,753	27,036	29,427	24,474
Political Science:				
reading-room books.....	12,567	11,208	9,088	8,956
over-night books.....	6,890	6,338	4,865	5,438
Totals.....	19,457	17,546	13,953	14,394
University College:				
reading-room books.....	33,325	30,746	30,992	28,310
over-night books.....	17,943	16,466	15,923	13,514
week.....	.....	.....	.....	593
Totals.....	51,268	47,212	46,915	42,417
Law reading-room:				
reading-room books.....	8,822	15,585	22,985	25,981
over-night books.....	2,870	4,368	4,004	4,302
week.....	251	524	373	499
Totals.....	11,943	20,477	27,362	30,782

The decrease here shown in circulation of books among undergraduates, which is the first noted in the Library for many years, is probably due in part at least to the fact that the University opened last autumn, because of the epidemic of infantile paralysis, a week late. This, however, does not wholly explain the decrease, since the circulation during the term itself showed a decline, except in the law reading-room. It would seem that we have now reached the peak of the phenomenal increase in the circulation of books among undergraduates that has taken place during the last twenty years.

The following is a statement showing the total circulation in the Library during recent years:

	1925-27	1934-35	1936-37	1937-38
To undergraduates	159,278	317,541	341,086	318,616
To professors and graduates	20,000	40,843	39,437	41,607
Totals	179,278	358,384	380,523	360,223

These figures are exclusive of books taken for consultation from the reference shelves, of which 28,092 have been replaced by the library assistants in the main library during the past year; and of course they take no account of the very considerable circulation of books in some of the departmental libraries.

The number of interlibrary loans continues to increase. During the year the Library has handled 851 interlibrary loans, as against 742 last year; 497 of these books being lent, and 354 books borrowed.

During the past year the binding and mending department prepared for binding 3,787 volumes, mended 2,301 volumes, and placed in pamphlet binders or boards 1,502 volumes. Library of Congress cards filed, temporary file, 40,667; permanent file, 85,045.

In addition to their ordinary work, the staff of the circulation department in the Library have this year revived the *Canadian Periodical Index*, which ceased publication in 1931. The staff had already embarked on the preparation of a card index of Canadian periodicals for their own use in reference work, when Mr. Angus Mowat, the recently appointed inspector of public libraries in the province of Ontario, kindly offered to print a Canadian periodical index in the *Ontario Library Review*, if any library would undertake to provide him with the copy. The circulation staff of the University Library took up his challenge, and the first quarterly installment of the revived index appeared in the *Ontario Library Review* for March, 1938. Already we have had numerous letters of congratulation and expressions of gratitude from librarians not only all over Canada, but in the United States. It would seem to be everywhere regarded as a genuine contribution to reference literature. It is hoped that at the end of each year the quarterly issues of the index will be cumulated.

Since I submitted my report last year the University Library has installed a library projector for reading microfilms. The growth of the use of microfilms in place of interlibrary loans made the installation of this projector a necessity, and it has proved its usefulness on a number of occasions. Its use, however, has yet been such as to suggest that microfilm is going to work the revolution in libraries that some people have anticipated.

During the past year the University Library has received from Dr. J. B. Tyrrell a valuable collection of geological periodicals; and by bequest from the late Mr. George H. Armstrong, the author of *The Origin of place-names in Canada* a remarkably fine collection of books relating to Canadian history and geography, as well as to education. I should like also to report that during the past three or four years a graduate of the University has annually placed at the disposal of the Library a sum of money for the purchase of books in psychology or law; and the Department of Mathematics is placing at the disposal of the Library the sum of $500. received by it as a prize won in the William Lowell Putnam Mathematical Competition. In this connection I should like to explain that special bookplates with appropriate inscriptions are inserted in books bought out of such special funds, and that there are few ways in which a name may be more suitably commemorated.

Once again I beg to bring to your attention the increasingly congested conditions in the University Library, both as regards space for books, space for readers, and space for library workers; and to commend to you the faithful service of my assistants in the Library, rendered in circumstances which are becoming increasingly difficult.

(13) REPORT ON RESEARCH

Anatomy, under direction of Professor J. C. B. Grant

During the summer vacation the head of the department made an anthropological study of the Stoney Indians who live in Alberta. He also completed a text-book of Anatomy on which he had been engaged for some years. This was published by Messrs. William Wood & Company, and is entitled, "A Method of Anatomy, Descriptive and Deductive".

Dr. R. K. George has collected many data on details of anatomical interest, e.g., the numbers and locations of the valves in the spermatic veins; pelvic diameters in relation to inguinal hernia.

Dr. C. G. Smith carried out experiments on rats to determine the effect on the olfactory mucous membrane of zinc sulphate solution used as a prophylactic in the poliomyelitis epidemic. It was found that this treatment led to a rapidly progressing degeneration of the olfactory sensory area culminating in sloughing of the olfactory nerve cells or in their complete degeneration and removal by the end of one week. Following this the surface was relined by non-sensory ciliated columnar epithelium. (This was completed by the end of the second week.) Observations were continued for two months after the treatment but no regeneration of the sensory olfactory cells could be recognised. The olfactory centres of the brain at the end of two months were markedly atrophic. Since the survey of the cases which received the zinc sulphate treatment during the epidemic last summer reveals a number with permanent loss of the sense of smell, it would appear that the injurious effects found in these animals occurs also in man, and that the treatment should be appreciated as being far from harmless.

Mr. H. E. LeMasurier in collaboration with the Poultry Department of the O.A.C. of Guelph, has made a radiological study of the growth of the skeleton of the chicken to six weeks of age. This work resulted in three reports (in press) with the following titles:—(1) A radiological study of the development of the fowl to six weeks of age on a mineral deficient ration. (2) The relation of the mineral supplement consumption to the normal skeleton development in males and females of various breeds of fowl to six weeks of age. (3) Some observations on the development of the fowl to six weeks of age.

Under Dr. A. W. Ham's direction:

Dr. K. Baldwin has been studying the various transitions in the histological structure of the alveoli of the lung from early foetal life until the time of birth, in rats, rabbits and guinea pigs, with a view to determining whether intra-uterine breathing motions, which distend the foetal alveoli do so by stretching the alveolar epithelium or by bursting through into the mesenchyme. This study is being pursued.

Miss Chapman, a graduate student and Dr. Ham have been trying to find a means whereby the growth stimulating effects evinced by certain hormones in vivo could be studied in vitro, their purpose being to learn something of the mechanism by which this influence is exerted. In pursuing this study it was first necessary to find a means whereby some hormone could be caused to accumulate in the blood in concentration sufficient to allow a small quantity of blood to remain active in this respect for several hours. Trial experiments have been successful. This study is being pursued.

Mr. Keenan and Miss Winston, students in the Histology Option Course, investigated the possibility of a uterine hormone being concerned in the oestrus cycle by removing uteri and studying daily vaginal smears. They found, in contrasts to some results reported by similar studies in other animals, that the oestrus cycle was not markedly altered.

Miss Fleming, taking the same option, with Dr. Ham and Dr. George, investigated the effect of longitudinal growth of bone on the position of tendon insertions and muscle origins

This year, as last year, the scope of the research of the department has been considerably enlarged by co-operative research with the department of paediatrics. With Dr. Tisdall and Dr. Drake, of that department, Dr. Ham has engaged in several experimental studies, e.g., on the cause of parathyroid gland hypertrophy; the action of vitamin D in large doses which is being studied by chemical analysis and histological studies of the same tissues.

Applied Mathematics, under direction of Professor J. L. Synge

B. A. Griffith, Ph.D.: Investigations are being conducted on the theoretical stability of viscous liquid contained between a rotating cylinder and a coaxial cylinder suspended by a torsion-fibre, as in a standard method employed in the measurement of viscosity.

G. E. Hay, M.A.: By the use of elliptic functions, last year's work on the torsion of certain prisms has been shortened and improved.

Teeth are held in their sockets by the thin periodontal membrane, which may be regarded as an elastic solid of small compressibility. The stress in the membrane and the displacement of the tooth under load have been investigated, and the results compared with those previously obtained by Professor Synge for an incompressible membrane. These investigations have been carried out under a scholarship of the National Research Council of Canada.

W. D. Rannie, M.A.: Various approaches to the problem of the stability of a viscous liquid flowing between fixed parallel planes have been tried, and work is now in progress on a method in which the characteristic functions of the problem are approximated to by polynomials.

A. F. Stevenson, Ph.D.: The variational method which has been much used in approximate calculations in quantum mechanics furnishes an upper limit to the theoretical energy levels. It is desirable to find also a lower limit in order to estimate the error. A method due to Weinstein for obtaining such a lower limit has been put on a somewhat more rigorous basis and the technique of the method improved. Calculations have been made, in collaboration with Professor M. F. Crawford of the department of physics, for the normal state of helium, with satisfactory results.

J. L. Synge, Sc.D.: New sufficient conditions have been obtained for the stability of a viscous liquid flowing between fixed parallel planes.

The preparation of an address on "Hydrodynamical Stability" for the Semi-Centennial of the American Mathematical Society has provided an opportunity to collate the various methods which have been employed and to suggest approaches to the discussion of general types of disturbance.

For liquid contained between two rotating coaxial cylinders, a sufficient condition for stability has been obtained without assuming the distance between the cylinders small, as in the work of G. I. Taylor.

Astronomy, under direction of Professor R. K. Young

General Programme

At the David Dunlap Observatory the programme of radial velocities of 500 stars in and near the Kapteyn areas is nearing completion. During the progress of this work 26 new spectroscopic binaries have been discovered and 69 others are suspected of being variable in velocity. 1125 plates were secured on this programme and the measurement of these plates and arrears from the last two years have been completed by Miss Northcott, Miss Patterson and Mr. MacRae. A comparison of the results of about 50 stars which have been

observed elsewhere shows that the systematic errors are small and that the probable error is satisfactory.

During the year five papers were presented at various astronomical meetings.

Spectroscopic Work

Dr. Hogg has completed the four binary orbits H.D. 25638, 25639, 206155, 183794 and taken plates for the improvement of the orbit of H.D. 34762 and for testing short period variations in H.D. 58715. Dr. Millman has made a photometric study of the surface features of Mars and finds that the dark markings are relatively rich in blue and violet light but that the results lend no support to the generally accepted view that this represents chlorophyll reflection. Dr. Heard has completed the orbit determination of H.D. 142926 and obtained plates for an orbit of H.D. 219634. Dr. Heard has also continued his investigations on the spectrum of γ Cassiopeiae.

Newtonian Focus

Dr. H. S. Hogg with the assistance of Dr. F. S. Hogg and others has obtained 91 direct photographs of globular clusters. About a dozen new variable stars have been found from D.D.O. plates in the important clusters N.G.C. 6205, 6366, 6779. A few more periods have been derived in the cluster N.G.C. 6402, but as this is a difficult object, with 72 known variables, it is expected that work on this cluster will extend over several years. The period of two variable stars in Messier 10 and 12 have been determined. A catalogue of all variables known in globular clusters has been made, giving data and magnitudes, periods and positions.

Meteor Research

The photographic and visual observation of the major meteor showers was carried out by Dr. Millman as in other years. One meteor spectrum was photographed as a result of exposure times totalling 53 hours with the meteor spectrograph, and eight direct meteor trails were secured in a total exposure of 23 hours. Five of the above photographs were secured with the rotating shutter. Twelve direct photographs were also secured at co-operating stations.

Instrumental

During the year a self-recording microphotometer was constructed in the observatory workshop. It is hoped that this instrument will be of great help in analysing the spectra already secured. The upper end of the 19-inch reflector has been remodelled so that it is rotative. This makes the instrument much more convenient to operate.

Biochemistry, under direction of Professor H. Wasteneys

Directed by Professor Wasteneys:

Mr. B. F. Crocker and Dr. Paul Hamilton have continued their investigations on digestion in dogs. They have confirmed their previous observation that as to the amount of protein fed to the animals is increased, the time required for digestion increases while the percentage digestion decreases.

The addition of fat to a protein meal was found to increase the time needed for digestion and also the amount of digestion.

They are now investigating a method of labelling the food protein in order to distinguish the products of its hydrolysis from those of the proteins in the digestive secretions.

Dr. H. B. Collier, professor of biochemistry, West China Union University, and now on leave of absence, has been engaged in a study of the factors determining the rate of synthesis of 'plastein' by the enzyme papain.

Directed by Professor G. F. Marrian:

Dr. G. C. Butler has continued his studies on the nature of the steroids present in the urine of women suffering from virilism of adrenal origin. A sufficient number of new steroids have been isolated and chemically characterised to enable an attempt to be made to outline some of the main metabolic paths of these compounds in the body. These researches promise not only to throw much light upon the etiology of adrenal virilism, but also to establish facts of considerable fundamental importance bearing on the problem of steroid metabolism.

Dr. A. D. Odell has continued his research on the constitution of the substance $(C_7H_{12}O)_n$ which occurs in the urine of pregnant mares. Evidence has been obtained which very strongly suggests that this substance is a pregnane- or allopregnane-3(α),6,20-triol formed by reduction and addition of water from the hormone of the corpus luteum-progesterone. Dr. Odell has been granted a Banting Fellowship for three months to enable him to continue and extend this work during the summer months.

Mr. B. Schachter, who is in receipt of a Banting Research Fellowship, is completing his research on the methods of isolation and the identification of the conjugated oestrogens in the urine of pregnant mares. Several new crystalline substances have been isolated which it is hoped will shortly be fully characterised. Mr. Schachter has also been engaged in attempts to isolate in a pure state the gonadotropic factor present in the urine of pregnant women.

Mr. W. Fishman has been successful in elaborating an efficient method for the extraction and purification of the enzyme β-glucuronidase from spleen and other organs. He has made a study of the distribution of this enzyme in various tissues and organs, before and after the administration of glucuronogenic substances. The results he has obtained are of considerable significance in the whole problem of the detoxification mechanisms in the animal body. Mr. Fishman will shortly be applying some of his findings to certain problems in connection with sex-hormone metabolism.

Mr. M. Darrach has obtained results which indicate that the coloured substance formed in the Kober test for oestrogens is an oxonium salt of 16,17-diketo-3-hydroxyoestratriene. This finding has enabled him to elaborate several qualitative tests which make it possible to detect oestriol in the presence of other oestrogens. One of these tests has been found suitable for quantitative work. Preliminary experiments suggest that 16,17-diketo-3-hydroxyoestratriene may be a normal end-product of oestrogen metabolism in the animal body.

During the past year a special laboratory has been equipped with apparatus for the micro-determination of carbon, hydrogen, sulphur, nitrogen, sodium and potassium, in organic compounds, in order to facilitate the identification of new compounds isolated in the research laboratories. Miss Dorothy Skill has been in charge of the work and has organised it with very commendable efficiency. This new departure has been of the utmost value in the various research problems in progress in the department.

Directed by Professor A. M. Wynne

Miss E. Macpherson B.A. studied methods of increasing the purity of preparations of pancreatic lipase, with the aim of using the enzyme in an investigation of its synthetic action.

F. L. Root, M.A. (Stanford), has investigated the improvement and application of methods for the analysis of mixtures of volatile fatty acids and of alcohols occurring in fermenting media.

J. Tuba, M.Sc. (Sask), has undertaken a study of factors which affect the amount of enzymes such as phosphatase and invertase formed by yeasts and moulds during their growth in synthetic culture media.

Biology, under direction of Professor E. M. Walker

The following summary includes investigations in progress, published or in course of publication, for the year 1937-1938:

Vertebrate Anatomy

By Professor W. H. T. Baillie—Studies on the eye reactions of fishes, amphibians, reptiles and mammals; beginning of the eye movements in developing fishes and amphibians; position and relationship of the semicircular canals of the ear in elasmobranchs and their homologies in the mammalia; investigations of a skin outgrowth in an amphibian that simulated an anterior limb with defective development of the muscular and bony parts.

Invertebrate Zoology (including entomology and parasitology)

By Professor E. M. Walker—Cervical and thoracic exoskeleton and musculature of Grylloblatta (completed); faunistic and distributional studies of Odonata of British Columbia, Saskatchewan and Ontario.

Under the direction of Professor E. M. Walker:

C. G. Bucher—Anatomy of Monodontomerus dentipes, a chalcid parasite of the pine sawfly *Diprion simile.*

Mrs. E. Kuitunen-Ekbaum—Life history of *Philometra americana,* a dracunculid nematode parasite of certain flounders, blennies and clingfish (completed); experimental infection of dogs and cats with plerocercosid larvae of Diphyllobothrium sp. from lake trout.

G. M. Neal—Distribution of pelagic Rotifera in British Columbia.

H. H. J. Nesbitt—Anatomy of the nervous system of insects.

H. B. Wressell—Effect of temperature on egg-laying in the European Corn Borer.

Marine Biology

By Professor A. G. Huntsman—Movements of Canadian Atlantic salmon kelts, as shown by tagging experiments and in relation to the environment.

Under the direction of Professor A. G. Huntsman:

A. A. Blair—Factors affecting the growth of salmon parr and smolts, principally as shown in the scales.

P. F. Elson—Factors determining movement of the trout, *Salvelinus fontinalis,* particularly the effect of temperature.

C. J. Kerswill—The oyster fishery of the Bras d'Or region of Cape Breton Island; the Pteropoda of the Belle Isle Strait Expedition of 1923 and the Canadian Fisheries Expedition of 1915.

H. M. Rogers—Marine fauna of the eastern Canadian Arctic (field work with the Eastern Arctic Patrol); the life history of the capelin, *Mallotus villosus,* of the Miramichi region, New Brunswick.

Mr. H. C. White of the staff of the Fisheries Research Board of Canada was given accommodation in the laboratory for the study of the food of kingfishers and mergansers of the Margaree River, Cape Breton.

Vertebrate Embryology

Under the direction of Professor A. F. Coventry:

S. H. Chambers—Comparative study of the umbelical hernia and its relation to the definitive arrangement of the coils of the alimentary canal.

Miss A. M. Ironside—Study of the corpus luteum of *Peromyscus* with special reference to its behaviour during immediately successive pregnancies and in different seasons.

Animal Bionomics, Mammalogy and Ichthyology

By Professor A. F. Coventry—Continuation of studies of population of small mammals in Ontario. Data have been collected in the neighbourhood of Toronto, in Algonquin Park, in Temagami and in Kapuskasing.

By Professor J. R. Dymond—Taxonomy and distribution of the fishes of Algonquin Park and Ottawa Valley; ecology and distribution of fishes of King Township; York County, Ontario.

Under the direction of Professor J. R. Dymond:

A. H. Carter—Life history of fishes of the genus *Nocomis*.

Miss I. Limbert—Distribution of fishes in Ontario.

J. M. Speirs—Studies of bird migration at Toronto (completed).

Genetics and Human Biology

By Professor J. W. MacArthur—Methods of diagnosis of twins and multiple birth sets by the use of skin ridges and other characters.

By Professor J. W. MacArthur in collaboration with Professor Norma Ford—Studies of the Dionne quintuplets, an identical set.

By Professor J. W. MacArthur in collaboration with L. Butler—The mode of inheritance of a quantitative character (size).

By Professor J. W. MacArthur in collaboration with Dr. A. N. Langford—Development at Vineland of a commercial greenhouse tomato immune to brown mould.

Under the direction of Professor J. W. MacArthur:

L. Butler—Analysis of fruit size inheritance in the tomato.

Miss V. Engelbert—Reproduction, cytology, genetics and species relationships in a group of species of blue grass (*Poa*).

Mrs. M. Richardson—Intelligence quotients in social problem children and their sibs and parents.

A. Wilkes—Causes of varying sex ratios in parasitic Hymenoptera (Monodontomerus).

Mrs. F. H. Miller—Comparison of human hand and foot prints.

By Professor Norma Ford—A study of two sets of quintuplets loaned by the Royal College of Surgeons, England. (Examinations have been made of their dermal ridges and other physical characters and x-ray photographs to determine whether the sets are mono- or polyzygotic); assembling of data regarding two unpublished cases of quintuplet births, Canadian and Italian; further investigation of the blood vascular system in the placentae of multiple births, correlating the findings with the degree of similarity of the twins or triplets (in co-operation with four Toronto hospitals).

By Professor Norma Ford in collaboration with Professor J. W. MacArthur—A biological study of the Dionne quintuplets, an identical set.

Under the direction of Professor Norma Ford:

Miss M. Macdonald—Plantar patterns in mongolian idiots compared with their palmar patterns.

Miss G. Workman—Palmar patterns in mongolian idiots and the occurrence of similar patterns in normal individuals.

Comparative Neurology

By Professor E. H. Craigie—Morphology of the capillary supply in the brains of amphibians (completed); quantitative study of the vascularity of the frog's brain and of the hypophysis of the frog (completed); vascular supply of the hypophysis of tailed amphibia; summarisation of existing literature on the Comparative anatomy and embryology of the capillary bed of the central nervous system.

Limnology

By Professor W. J. K. Harkness—Comparative limnological studies of trout waters in the districts of Nipissing, Muskoka and Southern Ontario.

Under the direction of Professor W. J. K. Harkness:

F. E. J. Fry and W. A. Kennedy—The life history and controlling factors in the production of the lake trout (*Cristivomer namaycush*) in the lakes of Algonquin Park.

R. R. Langford, W. R. Martin and V. E. F. Solman—Seasonal variation of plankton populations; comparative measurements of vertical distribution of plankton; plankton, small fish relations and vertical movements of small fish.

K. H. Doan—Ecology of small-mouthed black bass.

R. B. Miller—Ecology of lake living Chironomidae.

By Dr. F. P. Ide—Quantitative determination of insect population of Costello Creek, Algonquin Park, Ont. J. B. Buchanan assisted in the making of collections under direction.

Experimental Biology

By Professor K. C. Fisher—Investigations on the nature and mechanism of the rhythmicity of the heart; effect of temperature on heart rate; development of apparatus to follow spectroscopically the rate of certain chemical reactions inside living cells which are concerned with the mechanism of oxygen utilisation.

By Professor K. C. Fisher in collaboration with Dr. D. W. G. Murray of the Toronto General Hospital—Possible application to the control of intravenous injection of the electron tube relay with a time delay feature.

By Professor K. C. Fisher in collaboration with Dr. John Cameron University of Missouri—Relation of light intensity and temperature to the rate of the carbon monoxide poisoned heart.

By Professor K. C. Fisher in collaboration with Dr. Richard Ohnell of Stockholm—Relation of cyanide concentration to the heart rate.

Under the direction of Professor K. C. Fisher:

C. Armstrong—Respiratory mechanism of the frog heart; specificity of sodium azide, a new respiratory inhibitor, on the embryo fish heart.

Miss R. D. C. Martin—Measurement of the respiratory exchange of damsel fly nymphs; a method to investigate the inter-relations of temperature and oxygen partial pressure and the stage of development.

W. B. Stallworthy—Assembling of apparatus for the maintenance of constant known humidities to be used in the investigation of the water balance in land Isopoda in relation to the distribution of species.

Botany, under direction of Professor. R B. Thomson

Phanerogamic Botany and Genetics

Anatomy and Experimental Morphology

Bannan, M. W.—A study of the variations in wood structure in the native conifers and determination of the relationships between such variations and the ecological conditions under which the trees grow.

Haldenby, C. N.—The origin and distribution of horizontal resin canals in the conifers.

Hull, Kathleen L. & Thomson, R. B.—The anatomical organisation of *Lycopodium* and *Selaginella*.

Thomson, R. B.—The comparative anatomy of the male and female cone scales of the conifers.

Thomson, R. B. & Hull, Kathleen L.—The organisation of the sporeling of *Osmunda* and of the lower vascular plants.

Wright, J. Gertrude—The nature of the pit-closing membrane in the higher gymnosperms.

Taxonomy

The total number of specimens identified, mounted, stamped, recorded and actually distributed in the herbarium during the year was 11,472.

Krotkov, P.—Plant Survey work in the Bruce Peninsula; revision of the herbarium material; special study of Ontario willows and golden rods.

Taylor, T. M. C.—(1) A critical study of the genus *Woodsia*.
(2) Plant Survey work in the Thunder Cape and Schreiber areas, in co-operation with the National Museum of Canada. A report on the collection from the former area has been completed, and in connection with the latter a report is in course of preparation.

Genetics

Wright, J. Gertrude—A study of abnormal types of *Linaria vulgaris* and their heredity.

Mycology, Forest Pathology and Cryptogamic Botany

(Under the direction of Professor H. S. Jackson)

Bier, J. E.—A study of Hypoxylon Canker of *Populus*.

Cain, R. F.—A taxonomic study of Ontario Sordariaceae and related Sphaeriales.

Groves, J. W.—Cultural studies of certain canker forming species of *Dermatea*, *Pezicula*, *Godronia* and related forms. (In part submitted for publication.)

Jackson, H. S.—(1) The mycological flora of the Toronto region and of the Temagami Forest Reserve.
(2) A taxonomic study of Ontario Thelephoraceae.

Lehmann, A. J. V.—A study of the nuclear phenomena of the germination of teliospores of certain species of *Lepto-Puccinia*.

Macrae, Ruth—A study of phosphorescence in *Panus stipticus*.

Skolko, A. J.—A cultural study of *Aleurodiscus*.

There have been 4,735 specimens added to the Mycological herbarium this year and the collection now totals 63,470.

Plant Ecology and Seed Studies

(Under the direction of Professor H. B. Sifton)

Structural Ecology

McPherson, D. C.—On the structure, form and development of air spaces in roots.

Sifton, H. B.—Leaf development in Labrador Tea.

Watson, W. R.—Developmental studies of leaf structure as related to light.

Seed Studies

Anderson, E. C.—Longevity of weed seeds.

Hamly, D. H.—New apparatus for the investigation of light relationships in seeds.

Stereo-photomicrography of seeds.

McGugan, Jean E.—Identification of seeds and seedlings of the Genus *Brassica*.

Sifton, H. B.—Effects of temperature, light, water and oxygen supply on the germination of *Typha* seeds.

Collection and identification of seeds. During the year 2,120 additions were made to the reference collection. Total, 13,675.

From the seed laboratory, two papers were presented by special invitation during the year. The first, by D. H. Hamly on the subject of seed photography

was given before the 1937 convention of the International Seed Testing Association at Zürich, Switzerland, while the second, by H. B. Sifton, on seed collections, is to form a section of the manual on seed testing being compiled by the Association of Official Seed Analysts of North America. Both these associations are composed of professional Seed Analysts and they rarely ask for contributions except from their own members.

Plant Physiology

(Under the direction of Professor G. H. Duff)

Brodie, Anne B.—Tissue protein impairment induced by starvation has been studied in its effect upon respiration, respiratory quotient, water relations and chlorophyll content. The results have been presented in a thesis submitted in partial fulfilment of the requirements for the Ph.D. degree.

Clendenning, K. A.—The metabolism of the tomato fruit in relation to its storage. Biochemical studies of the proteins, carbohydrates and acids of the fruit have been begun in collaboration with the Cold Storage Research project of the Ontario Agricultural College. Special acknowledgment is made of the financial support and facilities provided for the summer work by the College.

Duff, G. H.—The sugars of the wheat leaf, their concentration gradients and relation to cell heterogeneity within the leaf.

Duff, G. H. & Forward, Dorothy F.—The rate of inversion of non-reducing, reserve sugar as a determinant of metabolic activity.

Plant Pathology

(Under the direction of Professor D. L. Bailey)

Except where otherwise stated, these researches are being carried on in co-operation with the Vineland Horticultural Experiment Station.

Bailey, D. L.—(1) Strawberry root-rot.
(2) Disease of ornamentals.
(*a*) Cytospora disease of Koster's blue spruce.
(*b*) Suspected virus diseases of lilies and Gladiolus.

Langford, A. N.—The development of a suitable greenhouse tomato resistent to *Cladosporium fulvum*.

Mead, H. W.—A comparative study of some seed-borne diseases of barley. In co-operation with the Dominion Plant Pathological Laboratory, Saskatoon, Sask.

Newell, P. G.—Bacterial leaf spots of tobacco. In co-operation with the Dominion Plant Pathological Laboratory, St. Catharines.

Simmonds, S. A.—Factors influencing the fungous flora of raspberry roots.

Woolliams, G. E.—Fusarium wilt of Zinnia. In co-operation with the Dominion Plant Pathological Laboratory, Summerland, B.C.

Cytology

(Under the direction of Dr. L. C. Coleman)

Coleman, L. C.—(1) The cytology of *Gasteria* and *Gasteria* X Aloe hybrids.
(2) The cytology of *Veltheimia viridifolia*.
(3) The preparation of Basic Fuchsin for the Feulgen stain (note ready for publication).

Coleman, L. C. & Haldenby, C. N.—The cytology of Scilla species.

Hillary, B. B.—(1) The Feulgen nucleal stain and its use in Cytology.
(2) Permanent preparations from rapid cytological technics (in press).

Chemistry, under direction of Professor F. B. Kenrick

Forty-two students were engaged in research during last winter under the direction of members of the staff of the Department of Chemistry.

The degree Master of Arts was conferred on twelve of these, viz:—Messrs. L. D. Finlayson, W. G. O. Hines, E. A. Hollingshead, F. L. W. McKim, J. H. Michell, W. A. Patterson, G. W. Rogers, Miss J. C. Romeyn, Messrs. J. Seath, G. A. Stewart, M. H. Thomas, G. E. Willey; also on Mr. J. H. Johnston, who worked under Dr. Barrett in the department of physiological hygiene, and on Mr. M. O. O'Sullivan who worked under Dr. Franks in the department of Banting medical research.

The Degree of Master of Science in Agriculture was conferred on Messrs. K. G. McPhee, C. P. Rivaz, A. O. Walberg who worked in the laboratories of the Ontario Agricultural College under the direction of Professor Ruhnke.

The Degree of Doctor of Philosophy was conferred on Mr. H. J. Bernstein, whose research was done under Professor W. H. Martin, and on Mr. K. K. Kay who worked under Dr. Barrett in the department of physiological hygiene.

The following were the subjects of research:

R. W. Allgood—The transport numbers of magnesium chloride in aqueous solution.

Professor F. Beamish—Estimation of ruthenium in ores;
The determination of the efficiency of pot assays for the platinum metals.

H. J. Bernstein, M.A.—The Raman effect and the chemical bond.

H. D. Bett—The photodecomposition of chlorine dioxide in carbon tetrachloride solution.

A. McG. Birks—Preparation of ethyl aminofuroate picrate.

W. H. Brown, B.A.—New reactions and new types of formic esters.

W. K. Buchanon—Sour taste of buffers.

D. M. Burpee—Analysis of lead-assay button.

M. Cohen, M.A.—Adsorption of gases on solids.

B. D. Deacon—The condensation of acetoacetic acid with glyceric and glycolic aldehydes.

L. D. Finlayson, B.A.—The solubility of carbon dioxide in various solutions.

Prof. H. O. L. Fischer—Chemistry of trioses; optically active fats; derivatives of glyceric acid.

I. G. Goddard—The germination of mushroom spores.

Prof. A. R. Gordon—Calculation of thermodynamic quantities from spectroscopic data.

Miss E. A. Grant—The Williamson ether synthesis with ethylene chlorohydrin.

W. G. O. Hines, B.A.—The activity coefficient of magnesium salts in aqueous solution.

E. A. Hollingshead, B.A.—Differential diffusion constants of electrolytes in aqueous solutions.

W. A. James, M.A.—The differential diffusion coefficients of electrolytes in aqueous solutions.

A. A. Janis, M.A.—The Vapour tensions of aqueous solutions of non-volatile salts by the Isopiestic method.

L. F. King, M.A.—The rates of reaction of alcohols and esters in an alkaline medium.

A. H. Klopp—Bromination of furan.

D. J. LeRoy, M.A.—The transport number of the alkaline acetates in aqueous solutions.

Prof. F. Lorriman—The alkaline reduction of 9-nitro-anthracene.

Miss H. G. Macmorine—The preparation of 3-hydroxy acenaphthene.

C. Marchant, M.A.—Bios.

J. W. McCutcheon, M.A.—The isomers of linolenic acid.
F. L. W. McKim, B.A.—The separation of solids by centrifuging in neutral liquids.
R. N. Meals, M.A.—The mechanism of the Fuziwara Reaction.
J. H. Michell, B.A.—The synthesis of various glycerides.
J. L. Monkman—Presence of cyanide in cadaveric material.
W. M. Orchard, B.Sc.—The preparation and properties of coniferin and related substances.
M. A. Partridge—The use of citraconic anhydride in the Diels-Alder Reaction.
W. A. Patterson, B.A.—The effect of temperature change on the diffusion of copper in a solution of copper sulphate.
Dr. J. J. Rae—The role of phosphoric esters in metabolism with particular reference to their occurrence in urine and their possible significance in mental cases.
G. W. Rogers, B.A.—The vapour pressures of volatile liquids and adsorption phenomena.
R. G. Romans, M.A.—Photochemical reactions.
Miss J. C. Romeyn, B.A.—The sporulation of yeast.
Miss C. J. Sanderson, M.A.—The influence of inositol, θ-alanine, l-leucine and Bios IIB on different varieties of yeast.
J. Seath, B.A.—Analytical methods for the determination of metals of the platinum group.
S. Shankman, M.A.—Vapour tensions of sulphuric acid solutions.
R. S. Soanes, M.A.—Carbon arcs.
Dr. Helen Stantial—Purification of Bios IIB.
G. A. Stewart, B.A.—Base-exchange in zeolites.
M. H. Thomas, B.Sc.—The kinetics of isomerization of 2-butene.
M. Wayman, M.A.—Purification of Bios IIB.
Dr. F. E. W. Wetmore—Electric thermoregulators.
G. E. Willey, B.A.—Distribution of potential in the carbon arc.
Dr. G. F. Wright—Synthesis and properties of coniferyl alcohol; Isolation of the carbohydrate from the pine lignin-carbohydrate complex.

Food Chemistry, under direction of Professor C. C. Benson

The research work in this department during the present session has, as usual, been concerned with the chemistry and analysis of foods.

Two students have completed work for the Master's degree. One of them working on the distribution of pectin in apples during ripening and storage, and the other trying different methods of estimation of carbon dioxide in baking powders and making studies of rates of reaction of such materials.

Other students in this department have been concerned with analysis of foods which have not yet been sufficiently tested, and this work is being continued.

Household Science, under direction of Professor J. B. Brodie

During the session 1937-38 there were four graduate students doing work in this department. Three of them were engaged in research and one was granted her M.A. degree.

Miss A. M. Musgrave began work on "Baking Tests for Baking Powders."

Miss E. F. Lamon, working under the direction of Miss Roberts in textiles, has made good progress in her studies on Canadian cottons with respect to their suitability for household use as determined by physical and chemical analyses. She plans to continue this work next year.

Miss G. H. Donald has completed her work on the calcium content of some Canadian vegetables. The first part of the study dealt with the variation of calcium content in vegetables grown on different soils while the second part of the study was a determination of the change in calcium content due to cooking. This study is of practical value and already some of the figures have been used.

Geology and Palaeontology, under direction of Professor E. S. Moore

Field investigations in geology:

Professor E. S. Moore—Atikokan area, for Ontario Department of Mines.
Professor A. MacLean—Continuation of study of the eastern part of the Kirkland Lake area, for Ontario Department of Mines.
Professor L. S. Russell—Geology of Southern Alberta, for the Geological Survey of Canada.
Dr. J. Satterly—Geology and ore deposits of the McInnes (Sandy) Lake area, for Ontario Department of Mines.
Dr. V. J. Okulitch—Stratigraphy and palaeontology of the Black River group, between Montreal and Quebec.
V. K. Prest, B.Sc., M.Sc., (Man.)—Geology of the Miminiska Lake area, for Ontario Department of Mines.
M. W. Bartley, B.Sc., (Man.), M.A.—Geology of northern and eastern sections of the Schreiber Map area, for Ontario Department of Mines.

Laboratory investigations:

Professor E. S. Moore—The formations of the Steeprock series.
Professor Madeline Fritz—Comparison of the Middle Silurian coral genera *Desmidopora* and *Multisolenia*, Microfossils from oil wells in south-western Ontario, and their bearing on structural features.
Professor L. S. Russell—Preparation of detailed report on four seasons field work in southern Alberta. The skull of Hemipsalodon, a giant carnivorous mammal from the Oligocene of Saskatchewan.
Dr. V. J. Okulitch—Columella-like structure in the Corallites of *Tetradium fibratum* Safford.
Interference wave markings in the Dundas formation at Toronto.
A revision of the Black River corals.
V. K. Prest, M.Sc. (Man.)—Wall-rock alteration in the Porcupine area.
W. P. Corking, B.A.—Genesis of the Sherritt Gordon ore deposits.
J. W. Britton, B.A.—Genesis of the Iron formations and their relation to gold deposits in the Patricia District.
G. P. Crombie, B.Sc. (Man.)—Carbonate alteration in the rocks of the Larder Lake area.

Department of Medical Research (Banting), under direction of Sir Frederick Banting

For some years the Department of Medical Research has had the co-operation of members of the mining group on the silicosis problem. During the past year the work has been continued as a general problem of the department.

On January 3, 1937, Mr. J. J. Denny and Dr. W. D. Robson, of the McIntyre Porcupine Mine, came to the Department of Medical Research and presented the results of their preliminary experiments by which they had shown (1) that the addition of small quantities of metallic aluminum dust almost completely inhibited the solubility of siliceous material in a laboratory beaker and that (2) rabbits dusted with quartz to which less than one per cent. metallic aluminum dust had been added showed practically no fibrosis, while control rabbits, which had been dusted with quartz alone, showed well developed silicosis. The lungs and other organs of the animals of these experiments had been sent to Dr. D. A. Irwin, of this department, for pathological examination.

These preliminary experiments seemed to warrant a large scale investigation, and during the year Dr. Irwin and Mr. H. L. Collins, of this department, have carried on this work in collaboration with Mr. Denny and Dr. Robson.

It has now been shown that rabbits exposed for six months to an atmosphere containing quartz dust developed a silicosis which continued to progress after cessation of the dust exposure. Rabbits exposed to similar concentrations of quartz to which had been added 1 per cent. of metallic aluminum dust did not develop silicosis, after an exposure of a year. These animals showed no evidence of silicosis after being removed from the dust for a period of a year. Metallic aluminum has been found to effectively inactivate the quartz retained by the lung when inhaled as a mixture with quartz or when inhaled alone.

Considerable evidence has been obtained concerning the mechanism by which metallic aluminum inactivates quartz in the lung. The relation that exists between the solubility of quartz powder in vitro, the tissue response produced by the injection of quartz powders of varying solubility, the amount of aluminum necessary to inactivate quartz and the period for which aluminum will continue to inactivate quartz has been studied. The practical application of metallic aluminum to the prevention of silicosis in industry is now under way.

The following investigations have been carried out with the co-operation and the financial assistance of the Technical Silicosis Research Committee of the Ontario Mining Association:

Miss H. Williams and Dr. Irwin have completed a study showing that the silicates commonly found in silicotic lungs are not leached to any appreciable extent by animal tissues up to periods of six months.

A study of the solubility of samples of quartz has been made by Miss Williams and Dr. Irwin. The samples were collected underground from the mining areas of Ontario by Mr. C. S. Gibson, of the above Committee. Professor H. E. T. Haultain, of the Department of Mining Engineering, ground the quartz in a ball mill especially constructed to avoid contamination and fractionated the resulting powders by means of the infrasizer he has developed.

Mr. C. S. Gibson and Dr. Irwin have investigated the toxicity of the various types of quartz encountered in the mining industry of this Province, and found them to be practically the same.

Dr. R. C. Sniffen and Dr. Irwin have demonstrated that certain silicates modify the action of quartz to increase or decrease its toxicity.

An X-ray diffraction pattern study of the crystalline siliceous materials present in silicotic lungs has been conducted by Dr. C. M. Jephcott, (Division of Industrial Hygiene, Provincial Department of Health), Mr. W. M. Gray (Department of Physics) and Dr. Irwin.

A detailed study of a rare case of simple silicosis uncomplicated by infection or the presence of siliceous dust other than quartz has been made by Dr. A. R. Riddell and Dr. Jephcott (Division of Indudstrial Hygiene, Provincial Department of Health) and Dr. Irwin.

A study of the shadows produced by various dusts in X-ray films of the chest is being carried out by Dr. R. C. Sniffen and Dr. Irwin, with the co-operation of Professor G. E. Richards (Department of Radiology).

Mr. B. S. Leibel and Dr. G. E. Hall have developed a greatly modified form of thermostromühr, by means of which accurate registrations of blood flow in arteries and veins may be made. Using this stromühr, changes in blood flow in the coronary vessels as a result of nervous influences are being studied.

These workers are also studying the effects of autacoids, hormones and drugs upon the coronary blood flow, ventricular output and total work of the heart in the isolated heart preparation, as well as in animals with denervated hearts.

Mr. G. W. Manning and Dr. Hall have conducted a series of experiments in which different branches of the coronary arteries have been ligated. The resulting myocardial changes have been studied at varying intervals so that specific

time relationships are available in connection with the development of the progressive pathological changes. They have also found that sudden occlusion of a branch of the coronary artery in the unanaesthetised dog is usually fatal whereas in the anaesthetised animals no deaths occurred. The obvious influences of cardiac afferent nerves are thus being studied.

Mr. Manning has prepared many fine cleared specimens of human hearts as well as hearts from various types of animals. By these it has been possible to specifically note the differences in coronary artery distribution as well as the differences in anastomosis between the various branches.

Mr. Manning, Miss J. Lang and Mr. M. Allan have studied the changes in blood sugar, serum choline-esterase, blood sugar and heart-rate following the administration of parasympatheticomimetic drugs in normal animals and in animals in which this enzyme system has been inhibited by prostigmine, physostigmine or miotine.

Dr. Hall is studying the inotropic and chronotropic cardiac stimulation in animals deprived of their cardiac sympathetic control as well as in completely sympathectomized animals.

Dr. Hall is continuing the work on coronary artery and myocardial damage following the daily intravenous injection of acetylcholine in dogs. He has also produced atherosclerotic lesions in rats following long-continued daily subcutaneous injections of the same drug.

During the progress of the above experiment an inordinate number of spontaneous tumours have been found. These have been reported on by Dr. Hall and Dr. W. R. Franks, who are continuing to study the possible relationship of acetylcholine to the oestrogenic and carcinogenic substances.

Mr. D. W. Lougheed and Dr. Hall have been conducting a large series of experiments in an endeavour to apply the intravenous injection of oxygen and of oxygen and carbon dioxide to clinical patients. The use of intravenous oxygen in carbon monoxide poisoning appears to be reasonable. The use of carbon dioxide and oxygen together with sodium bicarbonate may be of benefit in decreasing the alveolar carbon dioxide and increasing the oxygen of arterial blood.

Dr. S. Gordon and Dr. Hall are continuing the work on experimental nephritis. At the present time special attention is being paid to antigen-antibody relationship as produced by an injection of virulent streptococci in an animal already treated with many injections of a non-virulent culture of human haemolytic streptococci. The results are very encouraging.

Dr. Hall, Mr. D. Lloyd, Mr. J. Goodwin and Mr. B. Leibel have been engaged on the problem of the physiological significance of metrazol and insulin shock therapy in the treatment of schizophrenics. This is a division of a similar general problem undertaken by the Department in conjunction with the Departments of Psychiatry and Public Health, as well as the Committee on Mental Hygiene.

Mr. Leibel and Dr. Hall have studied the changes in the blood flow to and from the brain during experimentally produced insulin and metrazol shock.

Mr. J. Goodwin, Mr. D. Lloyd and Dr. Hall have studied the changes in the bio-electric potentials as recorded from the exposed area striata of the cortex during similarly produced shock. These potentials were recorded on the electroencephalogram which has been constructed in this Department by Mr. Goodwin.

Dr. Hall is conducting a series of experiments where groups of animals are subjected to repeated insulin and metrazol shocks for many weeks. Blood sugars, glucose tolerance tests, etc. are being carried out on these animals which will later be used by Goodwin, Lloyd and Hall in a comparative series of electroencephalographic studies of the effect of such chronic convulsions on the brain potential.

Mr. J. E. Goodwin and Dr. H. H. Hyland (of the Department of Medicine) are continuing their electroencephalographic studies of epileptic and other neurological cases from the Toronto General Hospital.

Mr. J. E. Goodwin and Dr. W. A. Hawke (of the Department of Paediatrics) are continuing their investigations of the brain potential changes in "behaviour problem" children as well as in the different convulsive states. They are studying, also by electroencephalographic recordings, the effects of hyperventilation, etc. in normal and abnormal children.

Mr. Lloyd has been working on the various phases of ganglionic activity in the autonomic nervous system with special reference to the following: (*a*) the excitability cycle of ganglion cells following activity; (*b*) the conduction of impulses by fibres which course directly through a ganglion; (*c*) retrograde transsynaptic electrotonus and (*d*) the slow potential waves set up by preganglionic and antidromic stimulation. Experiments have been started on the action potentials of a smooth muscle system (arrectores pili) excited by stimulation of the motor nerve supply. Recent developments from this work and by other workers in the field of nerve cell physiology have opened up many new questions for further experimental analysis.

Mr. L. Lawson and Mr. Lloyd have made a study of the potentials recorded from various parts of the cat's brain by means of the Horsley-Clarke instrument, both under normal conditions and under the influence of convulsive drugs.

In the biochemical division of the Department of Medical Research, Dr. C. C. Lucas has been studying the conditions necessary for the quantitative removal of cystine from protein hydrolysates, by a method which will not introduce any substances interfering with a subsequent separation of the remaining amino-acids. Mr. J. Beveridge and Dr. Lucas have been engaged in a study of the chemical make-up of human and other hairs. Mr. L. B. Macpherson has continued his work on the synthesis of phosphoric esters related to the phospholipids.

During the summer months of 1937, Dr. J. J. Rae, while holding the James Page Rutherford Fellowship, did further work on the phosphoric esters in normal human urine.

In collaboration with Dr. G. E. Hall and Dr. D. R. Mitchell (of the Department of Urology) Dr. Lucas has studied the physiological and biochemical properties of mandelic acid in connection with its use in the treatment of cystitis and pyelitis. Some hazards (such as acidosis and stone formation) have been found to be associated with the use of mandelic acid as a urinary antiseptic. It has been possible to discover the clinical conditions in which the drug is contra-indicated; in other cases the drug is a valuable bacteriostatic agent of great value in controlling urinary infections. Miss J. M. Lang and Miss M. E. Wheatley gave valuable technical assistance by their careful analyses for urinary calcium and phosphorus, respectively.

An outgrowth of the above research was a collaborative study of the use of sulphanilamide in urology—Dr. D. R. Mitchell contributed the clinical data, Dr. Philip Greey (of the Department of Bacteriology) studied the effects of the drug upon pathogenic micro organisms, both in vivo and in vitro, and Dr. C. C. Lucas, with the technical assistance of Miss Wheatley, conducted the biochemical control. The effect of the drug upon several species of animals, as well as upon healthy humans has been also studied. Dr. Hall has collaborated in some of the animal experiments where surgical, physiological and pathological assistance was required. It is particularly gratifying to record that as a result of the cordial inter-departmental co-operation the research progressed most favorably and for an exhibit at the recent Ontario Medical Association Convention, showing the results of the above collaborative research, Drs. Mitchell, Greey and Lucas were awarded a gold medal. The work is being continued and the program has been expanded.

Dr. Lucas and Dr. Mitchell have also commenced a collaborative study of kidney and bladder stones.

Dr. Lucas has given some time to furthering the cancer research program: several batches of very pure sodium ferricyanide and a quantity of glucuronic acid were prepared in this laboratory.

The following work has been carried out under the direction of Dr. W. R. Franks:

The work on the synthesis of chemoantigens from non-immunising compounds concerned in the pathogenesis of disease has been continued. As applied to carcinogenesis, immunisation of mice with antigen formed by linking dibenzanthracene to casein gives evidence of yielding protection against the carcinogenic action of the dibenzanthracene. The influence of such a procedure on spontaneous carcinogenesis in mice is under investigation.

The anthranyl and dibenzanthranyl isocyanates prepared by Dr. H. J. Creech in the above coupling to protein were identified by reaction with alcohols. The former substance and the β anthryl derivative are being used for possible cross-immunity against the carcinogens. Arrangements have been completed whereby the preparation of more suitable derivatives for anti-carcinogenic antigen formation will be conducted by taking advantage of the proffered co-operation of Professor L. F. Fieser, of Harvard University. To this end a grant has been obtained from the International Cancer Research Foundation to enable this phase of the work to be carried on by Dr. H. J. Creech under Professor Fieser's direction at Harvard.

The application of the above principle to tuberculosis carried on with the co-operation of Mr. M. O'Sullivan has been confined to testing linkage of organic iodo derivatives to sulphydryl groups of reduced keratin which itself shows some antigenic activity.

With the assistance of Miss M. M. Shaw, the in vivo activity of the isomers of glyceric aldehyde have been tested for possible synergistic activity with the toxic action of irradiation on tumors. The d- and the l-glyceric aldehyde were prepared by Dr. E. Baer, under the direction of Dr. H. O. L. Fischer, and the irradiation carried out in co-operation with the Department of Radiology.

Dr. E. M. Hearne Creech has continued her studies on the in vitro activity of water soluble carcinogenic substances on growth and cell division.

With the co-operation of Mr. G. A. Meek, the characteristics of monomolecular films of the above carcinogenic and related derivatives on surfaces are being studied.

With the assistance of Mr. A. E. Byrnes and Dr. L. D. Proctor, the influence of acute B_1 deficiency on glyoxalase has been studied. The glutathione content of brain in insulin hypoglycaemia has been similarly investigated.

Dr. E. M. Hearne Creech has studied in vitro the influence of phagocytosed silica on cell division.

Dr. Franks has studied the influence of the admixture of actively phagocytosed manganese dioxide on the development of experimental silicosis.

In co-operation with Dr. N. L. Easton, Director of Research of the Ontario Hospitals, Dr. Banting and Dr. Franks have been studying the development of certain refractory states to insulin, following prolonged administration of large doses of the latter.

Dr. Bruno Mendel, with the assistance of Miss F. Strelitz and Miss Mundell, has continued the study of the effect of glyceric aldehyde on the respiration of tumour cells. They found that d- glyceric aldehyde had no effect on the aerobic glycolysis of tumour cells. More recently they found that all the activity of racemic glyceric aldehyde was in the laevo rotatory form of the substance. Both the d- and l-glyceric aldehyde for this work was synthesised by Dr. H. O. L. Fischer and Dr. E. Baer.

Dr. Mendel has also tested a large number of chemical substances for their effect on the respiration and fermentation of the tumour cell, and has continued his investigations of sodium ferricyanide.

The facilities of the laboratory were extended to Dr. H. Krebs, Professor of Biochemistry, Sheffield University, England, during his three weeks' visit, for the purpose of investigating the effect of pancreatectomy on the metabolism of muscle.

Miss H. Ball continued the investigation of tuberculosis, using tuberculin treated with glyceric aldehyde.

Medicine, under direction of Professor Duncan Graham

During the past two years Dr. Cleghorn has been studying the functions of the sympathetic nervous system in adrenal insufficiency. It has been found that the functions of the sympathetic nervous system and the effect of pressor drugs are normal in adrenalectomised animals receiving adequate quantities of cortical extract. In adrenalectomised animals maintained on a high salt low potassium diet, the functions of the sympathetic nervous system appeared to be normal but the effect of pressor drugs showed marked qualitative differences. A report of this work is being published. Preliminary studies on the relation of surgical shock to adrenal insufficiency have been made. This work is being continued.

Drs. Cleghorn and Hyland, in association with Drs. Linell and Mills of the division of neuropathology, have published a most complete clinical and pathological study of a case of tumour of the pineal gland. As little is known of the function of the pineal gland, this report is an important contribution to our knowledge of the mechanism responsible for the production of the more important signs and symptoms present in this case.

Dr. Hyland, working in co-operation with the department of medical research, has made definite progress in the study of electroencephalograms from patients suffering from neurological conditions such as migraine and epilepsy.

The 1937 epidemic of poliomyelitis presented an opportunity for the study of a number of problems concerning the treatment of acute anterior poliomyelitis. Twenty-six patients in the pre-paralytic stage of the disease were treated with convalescent serum, but this treatment seemed to have no effect in preventing the development of paralysis or in modifying the course of the disease. In the treatment of respiratory paralysis different types of artifical respirators were tried. The Drinker respirator was by far the most effective during the acute phase of the illness and in cases where prolonged treatment was necessary. With a view to obtaining more accurate records of the progress of respiratory muscles showing paralysis, estimations of the vital capacity were made. Estimation of the vital capacity at intervals has proved to be a valuable aid for determining (1) the severity of the paralysis of the respiratory muscles at the onset; (2) the period of time each day a patient should be allowed out of the respirator after the acute phase of the disease is over; and (3) the length of time respiratory treatment should be continued. Unfortunately the method is not applicable in children suffering from poliomyelitis.

The results of repeated estimations of the vital capacity clearly show that prolonged immobilisation of the spine and ribs definitely impede the recovery of the paralysed muscles. It has been shown that the institution of suitable remedial exercises at an appropriate time promotes the recovery of paralysed respiratory muscles and thereby lessens the tendency towards the development of deformities. The application of similar measures in the treatment of paralysed skeletal muscles would appear to be indicated.

Drs. Hyland, Gardiner, Heal, Oille and Solandt will publish shortly a report of the clinical findings and results in treatment of sixty-six adult cases of acute anterior poliomyelitis.

Drs. Cleaver and Maltby have published a report on the results of medical treatment in forty cases suffering from gastric ulcer. The average age of the patients was fifty-five years. After approximately five years thirty-three

patients were free of symptoms, seven had symptoms suggestive of gastric ulcer, but only three of the forty patients presented X-ray evidence of an active gastric ulcer.

In 1931 Dr. Farquharson and the head of the department reported the first cases of Simmonds' disease discovered on this continent. At a recent meeting Dr. Farquharson, in association with Drs. Belt and Duff of the department of pathology, reported the results of a clinical and pathological study of four cases of this rare disease. The clinical manifestations of Simmonds' disease are closely simulated by those found in anorexia nervosa. Many of the cases reported as Simmonds' disease are evidently cases of anorexia nervosa. Drs. Farquharson and Hyland will publish shortly a report calling attention to differences in the clinical and pathological findings in these two conditions.

The effect of different vitamin deficiencies are being investigated. Dr. Wallace Graham has determined the vitamin C content of the urine in a variety of diseases. Cases presenting evidence of vitamin C deficiency have been given liberal quantities of ascorbic acid and its effect on the clinical condition of the patient observed. Changes in the gums and teeth in such conditions as diabetes mellitus, arthritis and nephritis are being studied.

Mineralogy and Petrography, under direction of Professor A. L. Parsons

Professor A. L. Parsons has carried on during the year the following investigations:

A study of the relations between the wave surfaces of light and the corresponding index surfaces in crystals.

A further study of the semi-precious stones of Canada.

Professor Ellis Thomson was engaged in the investigation of the ore minerals of the Denison Nickel Mine.

Professor M. A. Peacock completed the following:

A description of Goldschmidtine, a new antimonide of silver.

A new theorem, with a convenient graphical solution, for rapidly finding the spacing of any set of lattice planes in any lattice whose elements are known.

Assisted by Mr. L. G. Berry, a study of the crystallography and optics of four new salts prepared by Dr. J. G. Breckenridge and Mr. O. C. Smith in the department of chemical engineering.

In collaboration with Mr. M. C. Bandy, Llallagua, Bolivia, he completed a description of Ungemachite and Clino-ungemachite, new minerals from Chile.

Professor Peacock and Mr. L. G. Berry have completed the following investigation:

A study of the mineral copiapite. With the help of x-ray measurements made on our new Weissenberg X-ray Goniometer, they have determined the structural lattice and constitutional formula of the mineral and have revised the optics of the species. They are much indebted to Professor E. F. Burton and Professor H. J. C. Ireton of the department of physics who extended the facilities of the x-ray apparatus of the McLennan laboratory for their use.

Dr. V. Ben Meen has been engaged in the following studies:

Cleavage-luminescence in mica from Kilmar, Quebec.

An investigation of Cancrinite from Bancroft, Ontario.

The examination of a meteorite from Chile.

Mr. A. T. Prince completed a study of the mineral Sphene from Lake Clear, Renfrew County, Ontario and 16 Island Lake, Argenteuil County, Quebec.

A part of Dr. Peacock's time has been devoted, in co-operation with the departments of mineralogy in Harvard University and Yale University, to the revision of Dana's *System of Mineralogy*. This involves, not merely a compilation from the literature, but in many cases a complete re-examination of the minerals, with optical and röntgenographic measurements. The addition of a universal stage for the petrographic microscope and a part of the x-ray equipment necessary

for the study of crystal structures has facilitated such work. With the installation of the complete x-ray equipment for structural investigations the department will be admirably fitted to carry on this most important phase of mineralogy.

During the year the Walker Mineralogical Club was organised in affiliation with the department of mineralogy and petrography. Graduates from this university and colleagues in our sister universities and in the government service were consulted and asked to become members. The response has been very encouraging, for we have an organisation of two honorary members, fifty-one ordinary members and nine student members. A full account of the organisation appears in "Contributions to Canadian Mineralogy" for 1938.

So far as publication of results is concerned, the work of the department has been further supplemented by papers from members of the Walker Mineralogical Club, as shown below, which will be published in "Contributions to Canadian Mineralogy" for 1938.

Brownell, G. M. (University of Manitoba). Zeolites at the Sherritt Gordon Mine.

Osborne, F. F. (McGill University). Preliminary Notes on Pseudomorphs after Spinel from Kilmar, Quebec.

Poitevin, E. (Geological Survey of Canada). Natrolite from the Eastern Townships, Quebec.

Rutherford, R. L. (University of Alberta). Crystal Habit of the Orthoclase in the Crowsnest Volcanics at Coleman, Alberta.

Wilson, M. E. (Geological Survey of Canada). The Keewatin Lavas of the Noranda District, Quebec.

Obstetrics and Gynaecology, under direction of Professor W. A. Scott

Dr. J. R. McArthur returned in the fall from study abroad, and is assisting Dr. Cosbie in the radiological treatment of carcinoma of the genital tract in collaboration with the Institute of Radio-therapy.

Dr. M. C. Watson has continued his work in the study of Endocrinology and has again published an interesting paper on that work.

Paediatrics, under direction of Professor Alan Brown

As in the past, the staff of the Department of Paediatrics, University of Toronto, has been actively engaged in studies on the prevention and cure of the various diseased conditions encountered during infancy and childhood.

Work in conjunction with the Connaught Laboratories has resulted in the perfection of whooping-cough vaccine which is now being made available to the physicians of Ontario. The results obtained with this vaccine have been so striking that the routine use of whooping-cough vaccine for the immunisation of children against this dread disease is now advocated by practically all paediatricians in Ontario. During the year 1936, there were no less than 29 deaths in the Province of Ontario from whooping-cough. As the results with this vaccine indicate that 98 per cent of the children inoculated are rendered immune, the universal use of this vaccine will be the means of saving the lives of many little children.

Also in conjunction with the Connaught Laboratories, a serum has been developed for the treatment of influenzal meningitis. Formerly this disease was invariably fatal. Through the use of this serum, in the last 50 cases at the Hospital for Sick Children, 12 recovered and are now perfectly normal. This means that these twelve children owe their lives to the use of this serum.

It is well known that certain infections such as measles and chickenpox are disseminated by the causative factors being carried through the air. With this in mind, extensive investigations are under way to study air-contamination and means for its control. In one of the hospital operating-rooms, installation of

special ventilation and special ultraviolet lamps resulted in a reduction of the bacteria in the air much below that which has been previously obtained.

In recent years, it has been recognised that many forms of asthma are caused by minute particles of different materials in the air being inhaled by the patient. From studies conducted in the Hospital for Sick Children, it has been found that in certain refractory cases the offending substance has been house dust. Accordingly, extracts have been made up from house dust which have been effectively used in the treatment of these distressing cases.

Studies have resulted in an improvement of our methods of treatment of bronchiectasis, pyelitis, nephritis and diabetes. A continuous study of these and other conditions is constantly necessary in order to evaluate the newer therapeutic measures which are being developed elsewhere as well as here. The study of heart disease in children is giving encouraging results of a most practical nature. It is now possible to determine fairly accurately the degree of activity of the disease and just how much physical exertion the child can safely undertake.

The mental health of the child is not being neglected in our studies. Extremely interesting results are being obtained in a study in co-operation with the Banting Institute of the electrical currents in the brain in different diseased conditions. These measurements are being made by means of the electroencephalograph, which records and measures exceedingly minute electrical currents in different parts of the brain.

About the middle of August 1937, it was evident that Toronto and Ontario were in the initial stages of an epidemic of anterior poliomyelitis. This dread disease rapidly spread through most of the province and to other parts of the Dominion. The staff and research facilities of the department of paediatrics were immediately placed at the disposal of the health authorities of the province and city, and took an active part in the prophylactic and curative measures which were instituted. In co-operation with the School of Hygiene, the Department of Health of the Province of Ontario, and the oto-laryngologists of all the city hospitals, the prophylactic value of the zinc-sulphate nasal spray was investigated. It involved the spraying of some 5000 children and the careful comparison of the results obtained on this group and on a control group of children living in the same sections of the city and of the same age who had not received the spray. Unfortunately the results obtained indicate that this procedure as followed was not effective as a prophylactic measure. In the treatment of the disease, no evidence was found that convalescent human serum was of any benefit. In the course of the epidemic many emergency cases arose in which the unfortunate patients suffered from a paralysis of the respiratory muscles. To combat this phase of the disease no less than 27 mechanical respirators (iron lungs) were rapidly manufactured by the Hospital for Sick Children and used not only by the Department of Health of the Province but also were shipped to other parts of the Dominion.

There is no one factor in our daily lives which has a greater influence on health than proper nutrition. During the past year investigations have been undertaken on the need of vitamin A, vitamin C, iron and calcium. The utilisation of iron and calcium in various Canadian foods has been studied. These investigations are giving information that is of importance not only in the prevention and cure of obvious nutritional deficiencies but when applied generally this knowledge will result in an increased resistance to disease, a higher level of health, and increased longevity.

Pathology and Bacteriology, under direction of Professor W. Boyd

I have dealt in my report to the Dean of the Faculty of Medicine with the difficulty of following in the footsteps of so distinguished a predecessor as the late Professor Oskar Klotz. The various changes which have been introduced

in methods of teaching and in the development of the museum have also been considered in that report. In the present report reference will be made only to investigative work being done in the department.

Dr. G. Lyman Duff has analysed a rather large series of cases of carcinoma of the body and tail of the pancreas with the object of drawing attention to the tendency of these tumours to spread in such a manner as to produce misleading clinical symptoms and signs which have not hitherto been recognised as common in this disease. He has also collaborated with Dr. R. F. Farquharson of the department of medicine in a clinical and pathological study of 4 cases of Simmonds' disease which have come to autopsy in this department within recent years, and has assisted Dr. H. A. Dixon, also of the department of medicine, in his study of an unusual case of melanotic sarcoma. With the collaboration of Dr. D. E. Magner, Dr. Duff has continued and extended the experiments commenced a year ago on the effects of different protein derivatives upon the vascular systems of various animal species. Dr. M. O. Klotz has continued and completed his study of the association of silicosis and primary carcinoma of the lung, and he has also written an extensive review of the literature dealing with primary pulmonary cancer. Dr. D. E. Magner has made a study of various types of subacute myocarditis of unknown aetiology, and has prepared for publication a report of one case encountered at autopsy during the past year. Dr. H. C. Hair has been engaged in an histological study of infarcts of the lung with a view to establishing criteria for the determination of their age, while Dr. L. M. Gray has undertaken a study of testicular tumours which he will bring to completion during the coming year.

In the division of bacteriology the study of sulphanilamide and related compounds has been continued by Dr. P. H. Greey both on the experimental side as to their effect in tuberculous infections in animals and, in co-operation with the staff of the Toronto General Hospital, on the clinical use of these substances. The Ontario Medical Association at the annual meeting this year awarded a gold medal to Dr. P. H. Greey, Dr. C. C. Lucas of the Banting and Best department of medical research and Dr. D. R. Mitchell of the department of surgery for their exhibit on sulphanilamide treatment in urinary tract infections. Dr. W. L. Holman has published a masterly review of all the work that has been done on sulphanilamide up to the present time, a contribution to which all investigators will turn as a source of information for many years to come. Dr. Greey continued his research on bacterial synergism, has studied the heterophil agglutinins in infectious mononucleosis, and with Dr. Marion Ross has been determining the incidence of anaerobic streptococci in puerperal and other infections. Dr. D. R. E. McLeod investigated certain phases of the lysis of red blood cells. Dr. R. Margarite Price as part of her valuable work on tuberculosis has been correlating the results of the tuberculin tests which she has done since 1932 on the third year medical students and has retested the non-reactors (about half the class) during the next three years. The problem of bovine tuberculous infections in children has continued to attract her interest and the factors leading to the decreasing incidence, established by her diagnoses, are being better understood.

The division of surgical pathology has had to curtail its research activities somewhat due to the extra burden of routine work occasioned by the taking over of gynaecological pathology from the department of obstetrics and gynaecology. However work is still continuing on the problem of gastric and duodenal ulcers and it is hoped in the near future to have some interesting observations for publication. Experimental work was started on the aetiology of mixed tumours of the parotid gland, which it is hoped will clarify to a degree the vexed problem of their conglomerate nature.

The division of neuropathology has been strengthened during the past year by the appointment of Dr. J. Clifford Richardson as fellow in neuropathology and by the addition of Dr. E. H. Botterell to the staff in neurological surgery.

Dr. Richardson has undertaken a detailed study of the pathology of acute anterior poliomyelitis, and is also engaged in investigating oedema of the brain. Dr. Botterell, in addition to adding important surgical material to the files of the division, is interesting himself particularly in studying injuries to the nervous system. Dr. K. G. McKenzie and Dr. Linell in collaboration with Dr. W. L. Robinson are continuing their investigations in this field, and Dr. Botterell will prove a valuable addition to the team. Dr. Mary I. Tom has collaborated with Dr. D. Y. Solandt and Dr. Botterell in a histological investigation of regeneration of nerve and voluntary muscle following nerve-suture. Dr. Linell is engaged with Dr. E. Hall in an experimental investigation of the histological changes to be observed in the brain following insulin and metrazol injections. Dr. Burns Plewes has investigated and reported upon an interesting case of cervical cord injury. Other subjects which will be found in the list of publications are hypogonadism associated with pineal tumour, intracranial aneurysms, spontaneous haematomyelia, and cranio-cerebral injuries.

Pathological Chemistry, under direction of Professor Andrew Hunter

Drs. Nicholson, Urquhart and Selby, supported by a grant from the Banting Research Foundation, have continued on an extended scale their investigation of kidney function as affected by experimental nephrosis. One phase of this study has already been brought to a satisfactory completion. The degenerative changes in the cells of the proximal convoluted tubules have been shown to involve changes in permeability, which explain many of the functional derangements observed.

As part of the same general problem Dr. Nicholson and Mr. Gornall have studied the production of urinary ammonia in experimental nephrosis, and have obtained evidence that the site of ammonia formation is not the proximal convoluted tubule.

Dr. Hunter has completed his study of the action of arginase upon carbamido-arginine and has identified the products as urea and the hitherto unknown alpha-carbamido-ornithine. An anhydride of this substance, also new, has been prepared, and has been shown to be probably a piperidone. Attempts at the synthetic preparation of these substances are in progress. The general problem of the specificity of arginase is being explored in several other directions.

Dr. Hunter has devised methods for the preparation of arginine and ornithine by the use of appropriate enzymes. As a result ornithine in particular has been made much more accessible than it was, and considerable quantities of that substance have been prepared for research purposes.

In connection with the work on the specificity of arginase, Dr. Woodward has devised a new and simple method for the preparation of carbamido- and methylcarbamido-arginine.

Mr. Gornall has completed a useful study of the behaviour of carbamido-compounds in the Van Slyke method for the determination of amino groups.

Dr. Lawford has worked out a method of preparing partly purified and highly concentrated solutions of arginase, by the use of which he has been able to improve and greatly to shorten the method for the enzymatic determination of arginine.

Pharmacology, under direction of Professor V. E. Henderson

The research in the department has proceeded satisfactorily. Dr. Bonnycastle continued the work on adrenalin begun by Prof. Lucas last year, and the material is now ready for press. He has also begun a study of spinal anaesthesia, intending to settle the dispute in regard to the danger of direct poisoning of the respiratory centre by a local anaesthetic rather than a poisoning of the phrenic roots. This study has also made good progress.

Dr. Rice has continued some studies begun last year on the reflexes controlling respiration and the effects of drugs on the respiratory mechanism. A good deal of very excellent material has been obtained and a preliminary communication was presented before the American Society for Pharmacology and Experimental Therapeutics in April. A series of papers dealing with this work is in course of preparation.

Dr. Lucas has made a study of the oral absorption of bismuth, taking a new bismuth compound, Bisiodide, in order to obtain a thorough insight into the literature not only of the oral but of the intramuscular use of bismuth in the treatment of syphilis. His work was not only on animals, but owing to the co-operation of Drs. A. MacKay, W. B. Edmonds and E. B. Hardy he was able to follow the excretion in a series of clinical cases. The study has been of value not only in giving this department a thorough insight into methods and the literature, but also as a means of informing some members of the clinical staff of the problem and its literature. A paper dealing with this study has already been published.

Owing to the kindness of the Ohio Chemical Company, the department was provided with specimens of monochlor and dichlor cyclopropane. Both these are liquids, the boiling points approximating ether and chloroform respectively. Unfortunately these substances proved to be quite unstable in the animal body giving rise to marked lung lesions, and are of no value as anaesthetic agents. This study enabled the Head of the Department to complete an investigation of the more obvious possibilities of improving cyclopropane and led to the presentation before the Royal Society of a paper reviewing the historical progress of our knowledge of chemical substances having anaesthetic actions. It showed the disadvantages of the various anaesthetic reagents at present available and enabled certain deductions as to the possible physical and chemical characteristics of substances which would prove suitable anaesthetics. Papers dealing with these two topics are in press.

Physics, under direction of Professor E. F. Burton

Low Temperature Laboratory:

The following members of the staff and graduate students have co-operated in the work: Professors J. O. Wilhelm, H. Grayson Smith, and Arnold Pitt, Dr. A. H. Woodcock, demonstrator, Mr. K. C. Mann, holder of a War Memorial Graduate Fellowship, H. E. Johns, National Research Council Bursary, J. C. Findlay, R. W. Leonard Graduate Fellowship, and H. M. Bryant, assistant demonstrator. The following problems have been studied,—the effect of magnetic fields on persistent currents flowing in closed superconducting circuits, and the relaxation effects connected with the transition between the superconducting and non-superconducting states; the refractive indices of liquid helium I and II; the flow of liquid helium I and II through capillary tubes; the velocity of sound in liquid helium, and its compressibility; resistance and gas thermometers for use at liquid hydrogen and liquid helium temperatures; development of apparatus for the measurements of the magnetic susceptibilities of finely divided superconductors.

Spectroscopy:

The experimental investigation of hyperfine structure has been continued by M. F. Crawford, R. Richmond, and W. M. Gray. A light source which emits very narrow spectral lines has been developed and is being used to study the small hyperfine structures of the light elements.

The atomic spectra of mercury and lead have been analysed by M. F. Crawford and A. B. McLay, with the co-operation of A. M. Crooker and M. W. Johns formerly members of this department, but now engaged elsewhere.

Two theoretical researches on hyperfine and multiplet structures have been completed.

The spectroscopic determination of the amount of zinc in tissues that was undertaken some time ago for the Connaught Laboratories was completed during the year by S. Bateson. Several similar analyses are now in progress.

Geophysics:

Research in Geophysics has been carried on by Professor L. Gilchrist, A. R. Clark, C. H. Acheson, and M. J. S. Innes, as follows:

Laboratory Research

The determination of the average intensity of magnetisation and the equivalent susceptibilities of magnetic ore bodies.

A theoretical study of a useful collection of equivalent magnets as an aid to the magnetic exploration of ore bodies.

Results of combining electrical self potential methods with magnetic methods in geophysical exploration of magnetic ore bodies in the field.

Research in the Field

Field work carried out near Kenora, Ontario, in co-operation with the Northfield Mining Corporation.

Field work carried out near Kenora, Ontario, in co-operation with the Coniagas Mine Company.

Field work carried out near Maskwa Lake, Manitoba, in co-operation with the Stanmore Mining and Smelting Corporation.

During the year, as a result of a donation by Mr. T. Lindsley, of Ventures, Limited, Dr. Arthur Brant has held a fellowship in geophysics which enabled him to devote his whole time to research in this department. During the summer of 1937 he was in the field with a party under the Department of Mines carrying out geophysical investigations, and has already left with another party, under the same department, for further work during the summer of 1938. During the year he prepared, at the request of the Department of Mines, a comprehensive report on the use of the ordinary dip needle.

Colloidal Solutions:

Two graduate students were working in this field during the year,—Miss A. M. Crutcher, with a Bursary, and L. T. Newman with a studentship from the National Research Council at Ottawa; Miss Crutcher was investigating the problem of density of lyophobic solutions, particularly with reference to Bredig gold colloids to determine the actual density of gold in the colloidal state, and Mr. Newman the spectrochemical analysis of adsorbed ions in colloidal solutions.

Electron Microscope:

Mr. James Hillier, assistant demonstrator and Mr. Albert Prebus, under a bursary from the National Research Council have been working jointly on the construction of an electron microscope with very promising results. This work has been given some assistance by the National Research Council.

Research with Quartz Crystal:

Mr. D. W. R. McKinley has carried out a research on the problem of finding the velocity of light by the use of an oscillating quartz crystal.

Other Investigations:

Dr. John Satterly, with the cooperation of Mr. O. A. Gilmore, carried on a further study of the inclined water jet, by applying Bernoulli's principle to show that the pressure in the jet never varies greatly from atmospheric. This definitely disproves Levi-Civita's original theory. Parabolic projectile paths have been

plotted with the same initial conditions as the jet and in all cases the jet falls short of the projectile path. Assuming this to be due to the viscous resistance of the air, an estimate has been made of the thickness of the air carried along on the moving fluid. Velocity measurements within the jet have been made with a Pitot tube of small dimensions and results compared with computed velocities from flows and cross sections.

Professor H. A. McTaggart has been working on the measurements of the ellipticity of light reflected from thin films of oriented molecules. His experiments and observations call attention to the changes produced in the ellipticity of the light reflected from a number of monolayers of Barium Stearate placed on glass. A complete theory based on the ordinary laws of reflection and refraction at such surfaces would be necessarily a complicated one. Two experimental facts may be emphasised in cases where the light is plane polarised.

Films built up of oriented molecules on glass may be used to vary the ellipticity—from positive to negative values—of light reflected from them.

Certain thicknesses of film may be found which give plane polarised light at all angles of incidence.

Professor H. J. C. Ireton, with Dr. H. L. Welsh cooperating, has carried out a study of atomic collisions in caesium vapour and of the reflection of the caesium resonance lines from the surface of the vapour.

Dr. H. L. Welsh, worked independently, on an investigation designed to measure the efficiency of atomic collisions of the second kind in sodium vapour.

Mr. C. K. Cheng, graduate student, continued his work on dielectric constant measurements.

Mr. W. F. Oliver has completed a study on vitreous ice on which he has been working for the last two years.

The students listed below have been carrying on work under the following awards:

Miss A. M. Crutcher—Bursary from the National Research Council
K. C. Mann —War Memorial Fellowship from the Alumni Association
H. E. Johns —Bursary from the National Research Council
L. T. Newman —Studentship from the National Research Council
Albert Prebus —Bursary from the National Research Council
S. Levine —A Royal Society of Canada Fellowship—held at Cambridge, England
A. D. Misener —1851 Exhibition Science Research Fellowship held at Cambridge (second year)

Psychiatry, under direction of Professor C. B. Farrar

Further work has been done in collaboration with the Department of Medical Research on the intermediate products of carbohydrate metabolism in certain acute phychoses; also on the biochemistry of hypoglycemic shock. These studies are still in progress. In the out-patient service, a study of factors in the psychoneuroses is being conducted.

Psychology, under direction of Professor E. A. Bott

Fifty-seven graduate students took instruction in the department of psychology in 1937-8 of whom eight were enrolled from four other departments. Two candidates completed the requirements for the Ph.D. degree and eleven for the M.A. degree. The names of these candidates and the subjects of their theses are as follows:

For the degree of Doctor of Philosophy:

Long, Eleanor R.: A Study of Children's Appreciation of Consequences.
Northway, Mary L.: Bartlett's Concept, 'Schemata'.

For the degree of Master of Arts:

Bailey, Nora: An Analysis of Camp Records.
Bensen, Margaret: An Analysis of the Imitative Behaviour of Thirty Preschool Children.
Brown, Isabel: An Exploratory Study of Teasing.
Carson, Marjorie, E. C.: An Investigation of the Predictive Value of Intelligence Tests of Preschool Children in Foster Homes.
Lamon, Helen: A Study of the Color Selection of Young Children.
LeBas, Margaret: The Validity of Items of Preschool Tests.
Loeb, Nora: A Critical Study of McQuitty's Concept of Concomitance.
Ord, Violet: An Analysis of the Method of Art Instruction used at the Children's Art Centre, Toronto.
Rintoul, Dorothy F.: An Experimental Study of Laughter and Smiling in Preschool Children.
Sparling, Margaret: Variation and Predictive Value of the Intelligence Quotients of Preschool Children.
Stewart, Margaret C.: The Application of a Theory of Discipline in a Private Home Setting.

The increase in enrolment of undergraduates in psychology classes during recent sessions necessitated this year enlargement of laboratory accommodation and the re-organisation of some of our larger classes. This has been facilitated by the University securing the double house, 102 and 104 St. George St. for our purpose. As a result a more effective classification of our students in each year of the pass course will be possible; Professor Ketchum's social studies laboratory in 100 St. George St. will be enlarged to provide for practical work with honour students in sociology and psychology; suitable quarters for the vocational studies laboratory of Professor Cosgrave will be provided in 102 St. George St. as well as a laboratory for Professor Chant's advanced experimental psychology. These needed changes will permit more intensive work with graduate students as well as with undergraduates.

During the past session our staff have been engaged upon a number of special investigations.

Electrical equipment for the study of encephalograms has been completed by Professor Bott and Mr. H. C. H. Miller, also photographic equipment for the study of ocular behaviour with special reference to proficiency in reading.

Professor Chant has extended his investigations in the selection and educational adjustment of undergraduates through a special program relating to students in the first and second years of medicine which is being conducted in co-operation with the assistant dean of that faculty. Professor Chant has also advanced his previous studies in the psychology of reasoning and is continuing his work in conjunction with the Committee on Accident Prevention of the Canadian Public Health Association.

Professor Line's work upon psychological problems at the public school level has furnished valuable leadership both for teachers and graduate students who are interested in the operation of the new courses of study in Ontario Schools; the relation between children's thought processes and their personality traits, also the validity of certain pre-school tests of intelligence have received his special attention.

Professor Cosgrave in collaboration with Mr. V. S. Stevens, vocational counsellor of the Western Technical and Commercial School, has been engaged on a study in vocational guidance with approximately 1000 Grade IX pupils. Material has been compiled for a special course of instruction on occupations

which should assist such pupils in the choosing of a vocation and in planning the educational steps necessary to pursue it. In addition 30 persons of various ages have been systematically examined and vocationally advised during the year in his vocational laboratory. These cases have been referred individually from schools and social organisations in Toronto which co-operate regularly with our department for this purpose. At the request of the Director of the School of Nursing Dr. Cosgrave has also devised a series of selective tests for first year students in nursing. This study is planned over a period of years as a means of predicting aptitudes for work in nursing.

The psychological material which Professor Ketchum has collected over a period of years from students' life histories is now an invaluable source of data for analysis and research by advanced students. Our increased accommodation for social psychology will permit more adequate analysis of these and other social data bearing upon personality development.

Professor Bernhardt in cooperation with Professor MacArthur of the department of biology is supervising a study on the inheritance of certain behavior traits in mice in his comparative psychology laboratory. This study is planned to continue through several animal generations. Dr. Bernhardt has also assisted in supervising some of the graduate researches in child psychology in St. George's School.

Last year Professor Myers took a notable part in the planning and carrying out of the extensive statistical study which the Ontario Department of Health conducted relating to the incidence and results in treatment of cases of poliomyelitis in Ontario. The recent report of the Department of Health upon this study has received wide attention.

The graduate work of our department has been greatly stimulated through the generous gift at this time of a research fellowship by an anonymous donor, establishing the John Northway Memorial Fellowship at $500 per annum for a period of five years for advanced research in the field of personality development. The department aims to secure additional research fellowships of a similar kind for other essential phases of psychological work. The fields of vocational guidance, speech and reading disability, delinquency and penology, are examples of areas which await exploration if graduate students can be assisted through research fellowships.

Physiology, under direction of Professor C. H. Best

The various teaching courses proceeded in much the same manner as last year. New plans for the teaching of the practical work in third year medicine have been made so that the trimester system, to be introduced next year, can be utilised to the greatest advantage.

The researches carried on under the general direction of the head of the department were those of Mr. Louis Jaques on heparin and blood clotting and those of Mr. James Campbell on fat and carbohydrate metabolism.

Mr. Jaques has continued his researches on the purification and properties of fibrinogen and thrombin and the physiology of heparin. Promising results have been obtained in the purification of these proteins. He has also confirmed and extended his previous findings on the nature of the fibrinogen-fibrin reaction and has determined the solubility of fibrin.

With regard to the physiology of heparin the reaction of protamine with the anticoagulant has been studied. Chargaff's finding that protamine neutralises the action of heparin has been confirmed and the phenomenon extended to other basic proteins some of which have been found to have the same action. The reaction has been studied in vitro and characterised as a simple salt formation. On the basis of this work, a quantitative test for heparin has been devised. In collaboration with Dr. Waters, this has been applied to the blood of dogs in anaphylactic and peptone shock. The incoagulability of the blood in these

conditions has been shown to be due to heparin or a closely related substance released by the liver during the shock. These findings provide further evidence that heparin is a physiological substance. The studies on the relation between heparin dosage and effect on clotting time have been completed.

The investigation of the relation of the anterior pituitary gland to fat metabolism has been continued by Mr. Campbell. During the visit of Dr. I. A. Mirsky to Toronto last June, attempts were made to find the immediate effects of adrenalectomy on the ketonaemia produced in rabbits by the injection of anterior pituitary extracts. This study is as yet incomplete.

In co-operation with Miss J. H. Ridout, it has been found that a fasting ketosis occurs in rats whose livers have been made fatty by high-fat low-choline diets but this does not occur in normal rats. An "adaptation" to this ketosis occurs, but by the injection of anterior pituitary extract a greatly increased ketonuria is produced to which the animals may again become adapted. There is no constant relationship between the ketonuria and the level of liver fat. The ketonuria produced by anterior pituitary extract during fasting is greatly in excess of the fasting ketonuria after high-fat low-choline diets although the level of liver fat may be the same in both cases.

The "diabetogenic" action of anterior pituitary extract on normal dogs has been studied. In several animals the "diabetogenic effect" described by Houssay and his collaborators has been produced. In one a slight, apparently permanent diabetes was produced. In another an intense diabetes was produced which persisted after discontinuing the injections. Subsequent findings strongly indicate that the diabetes had been produced by a degeneration of the islets of Langerhans of the pancreas.

Tests whereby the various physiological activities of anterior pituitary extracts may be assayed have been developed and others are in the process of development. A method of assaying the potency of anterior pituitary extracts in increasing liver fat has already been described.

Fractionation of anterior pituitary extracts has already thrown some light on the nature of the substance present in such extracts which increase liver fat.

Mr. Campbell has also been helping Dr. N. B. Taylor with certain experiments where anterior pituitary extracts have been used.

For the past year Dr. R. E. Haist and Miss L. E. M. Roddy have been engaged in research under Professor N. B. Taylor's direction. Research assistance was given by Dr. T. H. Clarke of London, Ontario, who spent from September 1st to January 1st in the laboratory. His time was devoted mainly to experimental work on intestinal obstruction. Problems connected with intestinal obstruction continue to interest Professor Taylor and his collaborators, and a fair proportion of the time available for experimental work has been given over to this research. Dr. Haist is carrying out another series of experiments to determine the relation, if any, of the general effects of intestinal obstruction to the level of the plasma potassium. Among other researches at present under way is a study by Dr. Haist of the behaviour and reactions of decorticated animals. Studies upon calcium metabolism are being continued. The action of parathyroid extract upon the serum calcium of nephrectomised animals has been investigated. It has been stated that such animals fail to show the usual effects of the parathyroid hormone. No substantiation for the claim was obtained from this investigation. The effects of parathyroid extract and of viosterol have also been studied in puppies in which rickets had been induced by the administration of beryllium carbonate; animals in which the rickets is well marked are resistant to the action of the hormone, and also, but to a less extent, to viosterol. The relationship of parathyroid function to the action of prolactin upon the crop glands of pigeons is under study. Some interesting and suggestive observations have already been made. The pathogenesis of gastric and duodenal ulcer is a question upon which some light may be thrown from the experimental side. With this end in view, the actions of colchicine and cinchophen upon the gastric

mucosa have been under investigation. Chronic ulcers in the pyloric region have been produced in a large proportion of dogs treated parenterally with the latter drug.

Professor Taylor, as co-author with the head of the department, has just published "The Living Body", a junior text in physiology requested by Messrs. Holt and Company for use in American colleges.

In the department of physiology the section in biophysics, under the direction of Dr. D. Y. Solandt, has carried out physiological research along a variety of lines. Mr. J. W. Scott has been working on the so-called reaction of degeneration in denervated muscle. A method of measuring the time constant of accommodation in human nerve using linearly rising exciting currents has been perfected, thereby greatly simplifying the clinical measurement of this factor. Work started in the previous year on the excitation of single muscle fibres and its relation to neural connections has been carried further. Dr. E. H. Botterell and Dr. Solandt have collaborated on the measurement of the excitability constants in normal and in regenerated mammalian nerve. Through Dr. Botterell and Dr. T. S. Perrett this section has co-operated with the department of surgery and the section of urology in certain clinical investigations. Mr. F. L. Robinson has worked with the section in biophysics on the construction of a double cross-circulation pump of novel design. Mr. J. D. Brown has built an electronic device with several new features for the rapid measurement of hydrogen ion concentration by the glass electrode method. During the epidemic of anterior poliomyelitis in the summer and autumn of 1937 the section in biophysics collaborated with the department of paediatrics in the Toronto Hospital for Sick Children and the department of medical research in testing devices for the artificial respiration of patients with respiratory impairment. Collaboration of this section with the staff of the department of physiological hygiene in a study of the effect of heparin on coronary thrombosis produced in dogs is outlined elsewhere.

Dr. E. T. Waters and Dr. I. A. Mirsky of Cincinnati joined in an investigation on the utilisation of β-hydroxybutyric acid by the mammalian heart-lung preparation. Briefly, it was shown that there was no semblance of a fixed ratio between the amounts of carbohydrate and of β-hydroxybutyric acid used by the heart and lung; also that there appeared to be preferential utilisation of carbohydrate.

Further investigations have been made by Dr. Waters and Mrs. J. P. Fletcher on the effect of fructose on the glucose tolerance curve. A number of other substances have been used instead of fructose; so far sorbitol is the only substance which gives an effect similar to fructose on the glucose tolerance curve. Sorbitol is even more potent than fructose. Sorbitol appears to be absorbed from the intestinal tract only very slowly and this fact accounts, partly at least, for earlier reports that sorbitol cannot be utilised by the mammalian organism. It is now demonstrated that parenteral injection of a solution of this substance into a fasting rat leads to a rapid accumulation of glycogen in the liver, and at a considerably faster rate than in control animals receiving an equal quantity of glucose.

Dr. Waters in collaboration with Dr. J. Markowitz has conducted investigations on anaphylaxis in the dog. It has been shown that, contrary to general belief, the anaphylactic reaction can still be obtained in a sensitised dog under ether anaesthesia, even after complete removal of the liver.

Dr. Fidlar has collaborated with Dr. Waters in experiments which had to do with the relationship of the respiratory quotient to the blood sugar level and the response to sugar feeding. With Dr. McHenry, experiments were made in the hope of obtaining from the respiratory quotient some evidence of the effect of vitamin B_1 in the metabolic change of carbohydrate into fat. With Miss Ridout, experiments were carried out to determine the metabolic rates of groups of rats under various conditions. Observations were made with Dr.

Haist on a hemidecorticate dog in the fasting state and with Mr. Campbell on a fasting "pituitary diabetic" dog. Dr. Fidlar's co-operation with his various colleagues has been greatly appreciated by them and by the head of the department.

The head of the department gave the Nathan Hatfield Lecture at the College of Physicians and Surgeons in Philadelphia on April 6th, and lectures in Cincinnati, Indianapolis and Dallas during the academic year. He is to give the Stephen Paget Memorial Lecture on June 9th in London, England.

During the past year the head of the department has acted as Chairman of the Scientific Advisory Committee on Nutrition to the Dominion Council of Health.

Surgery, under direction of Professor W. E. Gallie

For the assistance of students and instructors the department is proceeding this year with the development of a museum of applied anatomy. Dr. Ross McKenzie who is attached to both the department of anatomy and the department of surgery has been detailed to make dissections under the supervision of Professor Grant, which will provide permanent demonstration of those anatomical fields that are of interest to the surgeon. These will be of great value in both undergraduate and graduate teaching.

Through the courtesy of Sir Frederick Banting and the willing co-operation of the Superintendent and Board of Trustees of the General Hospital, an electro-encephalographic machine has been built and installed by the department of medical research in a room adjacent to the neuro-surgical operating room. It is hoped that this apparatus will prove of value in the definite localisation of brain tumours. Having the apparatus close to the operating room will make it possible for the surgeon to apply electrodes directly to the surface of the brain and so obtain records of the changes in bio-electric potentials associated with tumours. Throughout the coming year an attempt will be made by the departments of medical research, medicine and surgery to determine the clinical value of the apparatus.

Dr. Gordon Murray has continued throughout the year the study of the clinical applications of "heparin." An adequate supply of this expensive biological product has been provided through the generosity of Mr. J. Stanley McLean and the Connaught Laboratories. It is now definitely established that it is of great value in all operations on blood vessels and the heart, in preventing thrombosis, and the results in spontaneous venous thrombosis suggest that it is of value in preventing the extension of thrombus. The clinical experiment described last year to determine its value as a preventive of post-operative pulmonary embolism has been continued and is giving encouraging results.

Encouraged by the definite value of heparin in preventing thrombosis at the site of operations on blood vessels, Dr. Murray has enlarged the field of blood vessel suture to include free transplants of veins to replace gaps in arteries. This can be done with a high percentage of success in animals and its possibilities in wounds of great vessels and in tumours and aneurisms are highly interesting. He has also made some progress in an attempt to replace damaged heart valves.

In recognition of his work on heparin, Dr. Murray has been appointed Hunterian Professor in the Royal College of Surgeons of England and he will lecture on the subject in London early in the spring of 1939.

The study conducted by Dr. W. S. Keith on the use of free transplants of nerves that have undergone Wallerian degeneration has now reached a stage where it can be shown that following such operations there is a return of function in animals and that there in a down-growth of axis cylinders through the degenerated graft. No opportunity has occurred in the general surgical service to make use of the principle involved but encouraging results have been reported by Dr. J. A. Sullivan in lesions of the facial nerves in temporal bone. Dr. Keith's work has been supervised by Dr. Linell of the department of pathology.

Dr. Stuart Gordon has continued his experimental studies of the influence of refrigeration on free transplants of skin, fascia and bone. He is also engaged, in conjunction with the department of radiology, in studying the influence of x-ray, such as is used in the treatment of cancer, on skin grafts. These studies have important clinical bearings.

At St. Michael's Hospital, Dr. C. H. Watson and Dr. T. R. Sarjeant have conducted a study of the effect of the sterilamp in preventing the infection of wounds. This study is approaching completion.

Dr. D. R. Mitchell of the department of urology in collaboration with Dr. G. E. Hall, Dr. C. C. Lucas of the department of medical research and Dr. Philip Greey of the department of bacteriology have conducted an exhaustive and successful study of the uses of mandelic acid and sulphanalamide in infection of the kidneys and bladder and urethra. For this work they were awarded a gold medal by the Ontario Medical Association.

In addition to the laboratory studies several important clinical researches have been going on. Drs. R. I. Harris, Charles B. Parker and R. M. Janes have conducted an exhaustive follow up and analysis of the cases of biliary disease encountered in a period of years. Dr. H. W. Wookey has undertaken a study of total oesophagectomy for cancer, which has already yielded encouraging results. An original suggestion that the approach should be made from the right side and include ligation and section of the vena azyos major has proved helpful. Dr. Botterell is engaged in a careful study of the sensation in a patient on whom Dr. K. G. McKenzie did a hemidecortication. Dr. Keith Welsh is continuing his studies of staphyloccus infection. Dr. R. I. Harris has studied the clinical results of the treatment of hernia by sclerosing fluids and has presented interesting experimental and autopsy material illustrating the effects. Dr. E. E. Shouldice has been studying the effect of the use of fascia lata in reconstructing and supporting the transverse metatarsal arch. Dr. R. R. Graham has continued his efforts to find a way to make total gastrectomy for cancer a safer operation. Dr. F. I. Lewis and the head of the department have interested themselves in an effort to induce union of ununited fractures of the neck of the femur by reduction of the displacement and the introduction of a Smith-Peterson nail and a bone graft, without a major operation.

As in former years combined studies in the follow-up clinics have been conducted by this department in conjunction with the department of radiology. These include studies of oral carcinoma, carcinoma of the breast, malignancies of various kinds in the genito-urinary tract, and sarcoma, wherever it may occur. These combined studies have proved most interesting and are leading to a mass of accurate observations upon which authoritative opinions can be based.

The epidemic of infantile paralysis which occurred in Toronto in the autumn of 1937 gave the surgical staff at the Hospital for Sick Children a wonderful opportunity for service under pressure. Their particular contribution consisted of the development of a type of splint which could be easily applied and which would prevent, to a large degree, the deformations which so quickly follow the acute stage of the disease. In conjunction with the medical staff they organised and managed successfully a large special hospital devoted solely to poliomyelitis and altogether did an excellent piece of work.

Therapeutics, under direction of Professor R. F. Farquharson

As formerly, research work in the department of therapeutics has been closely associated with similar activities in the department of medicine, particular attention being paid to certain aspects of the therapy of various haemopoietic and endocrine diseases.

Report of the School of Engineering Research

The following researches have been in progress during the past year.

Department of Civil Engineering

Under the direction of Professor C. R. Young

A research on the lateral supporting force for steel columns and struts has been continued. An analysis of the experimental results has been completed and a paper reporting these results is in preparation.

Under the direction of Professor T. R. Loudon

A research has been in progress into the effect of "cut outs" in monocoque construction fuselages by means of the Photo Elastic method. This problem was suggested by the Department of Transport through the Aeronautic Committee of the National Research Council. The preliminary results have been presented in a paper to the Aeronautic Section of the American Society for the Advancement of Science

Department of Mining Engineering

Under the direction of Professor H. E. T. Haultain

The study of size analysis of fine powders has been continued.

Under the direction of Professor J. T. King

(with S. E. Wolfe)

The investigation on methods for the determination of gold in cyanide solutions was continued. A paper on this was presented in *Canadian Mining Journal*, January, 1938.

(with S. E. Wolfe and M. Hewer)

Further study of the iron-nail method of assay was made, using additional reagents, with the objective of improving the method.

(with M. Hewer)

A research was commenced on the determination of impurities in silver beads from cupellation.

Under the direction of Professor F. C. Dyer

An adaptation of ore dressing methods to the treatment of soil for the concentration of seeds for analysis. This research has been completed and will appear in the July number of *Scientific Agriculture.*

The development of a new dry process for the separation of particles, in particular some kinds of seeds, has been brought to a semi-commercial stage.

Department of Mechanical Engineering

By Professor R. W. Angus

The investigation on water hammer which was in progress last year has been continued. This problem has become very important indeed in connection with hydro-electric plants on account of the sudden and great variations in load which frequently occur in connection with these plants. Any variation in load is accompanied by a change of velocity of the water in the penstocks, draft tubes and other passages, and this change of velocity always gives rise to abnormal pressures which may, and often do, become very dangerous.

Some of the operating and designing companies have had so much difficulty that they have spent much time determining the pressure rises which occur and have conferred with Professor Angus on the solution of their problems. The work formerly had to do with single pipes of uniform and of variable diameter, but during the past year the investigation was carried out so as to apply the method devised to branched pipes, as well as pipes with surge tanks and various complicated systems of piping.

In addition to the application to hydro-electric plants, the methods developed have been used in connection with waterworks systems, and studies have been

made for some of the municipal waterworks engineers, and the results have been used by them in designing their systems.

As a result of the investigation, three papers have been published and appear in the transactions of engineering societies and in the *Canadian Engineer*. The work is being continued throughout the next session and further papers are in preparation.

Under the direction of Professor R. W. Angus
(with G. Gung)

During the session a postgraduate student, Mr. George Gung, carried out investigations, under the direction of Professor Angus, on flow in open channels and on other subjects. The first investigation was the determination of discharge coefficients for siphon spillways and a study of the connection of these coefficients with the Reynolds number. For this investigation, two models of the same spillway were made, one of the models being twice the size of the other, and a study of the flow conditions through them was made, and is still in progress.

A further investigation was carried out on flow over weirs, to determine the effect of the width of the crest on the coefficients and behaviour of the weirs. For this purpose, weirs of different crest width from one inch up to twelve inches were set up in the glass trough in the hydraulic laboratory, and the results of these studies have been compiled and a report is about ready. This study, however, will have to be continued, as only the preliminary work has been done in connection with it.

The investigation included the effect of submersion of the crest, the water being carried to different depths below the weir. In this same connection, an attempt was made to determine the nature of flow in a long channel with horizontal floor, a flat brass plate being set up in the glass trough, and conditions of flow over it were studied. While a good deal of progress was made with this investigation as well, much still remains to be done and a study of this will be continued during the next session.

There has been need of information with regard to the action of valves in pipe lines, and to determine this, three valves were set up in succession in a pipe line and the coefficients for these were determined, as well as the pressure drop for different gate openings, in each case. This study proved of very great interest and it will be of value in connection with hydraulic practice, so that it will also be continued during the next session with larger sized valves and with other types. A report of the work done during the present session has been prepared.

Under the direction of Professor E. A. Allcut
(with F. G. Ewens and R. J. Birss)

The investigations on the properties of heat insulating materials were continued, with particular reference to air infiltration and the influence thereon of the density and structure of commercial materials. Studies were also made on heat transmission across air spaces of various shapes and sizes.

School of Architecture

Under the direction of Professor E. R. Arthur

Research has been continued on the old buildings of Ontario.

In connection with the restoration of St. Andrew's, Niagara-on-the-Lake, research of an historical nature was undertaken. Papers, drawings, etc., were examined in the Provincial archives and in the Niagara Historical Museum. Letters were sent to the descendants or relatives of former ministers.

The church has in its possession the minutes of Vestry Meetings back to 1792 and records of baptisms of an even earlier date.

As a result of this research a brochure, "St. Andrew's Church", was published under the auspices of the School of Engineering Research.

There seems to be a growing interest in the subject of the early architecture of the Province. Many people have written to the School offering or seeking information.

A brochure on the Early Buildings of Ontario, by E. R. Arthur, with a foreword by John Alford, is being published at the University Press under the auspices of the Ontario Department of Education.

Department of Applied Physics

Under the direction of Professor K. B. Jackson

The research on a new form of light source for the inspection of specular surfaces has been continued and extended.

(with D. H. Hamly and L. E. Jones)

The research on photographic sensitometry has been continued.

Department of Chemical Engineering

Under the direction of Professor J. W. Bain

(with B. Marks)

An investigation has been in progress for the purpose of determining the nature of the reaction which was found to take place between sodium sulphide and lignin.

(with N. R. Fasken)

A study was made of the oxidation of lignin with periodic acid and some interesting data have been obtained.

(with G. V. Jansen)

The research on an investigation of the chlorination of spruce wood, and of the resulting chlorolignin was completed and published in the July, 1937, issue of the *Canadian Journal of Research.*

Under the direction of Professor M. C. Boswell

(with W. H. Rapson)

The use of glucose as a source of methyl groups in the methylation of glycin was investigated. This research is still in progress

Under the direction of Professor E. G. R. Ardagh

(with G. T. Eaton)

A research into the reactions of thiophene has been continued and it is expected that results which will warrant publication will be obtained in the not distant future.

Under the direction of Professor E. A. Smith

(with W. L. Phene)

An investigation has been in progress on the solvent refining of lubricating oils, with special reference to Athabasca bituminous oil.

(with G. V. Jansen and E. DeLuca)

A study of the penetration of dyes on conditioned silk has been in progress. The results of the investigation will be published in the near future.

Under the direction of Professor R. R. McLaughlin

(with G. P. Beal)

A research on the ageing of rubber due to the presence of copper salts has been completed and the reason for the deleterious action determined. Results will be published in the near future.

Department of Electrical Engineering

Under the direction of Professor H. W. Price

Absolute reliability of automatic electric control circuits is a matter of great importance. If the relays employed must operate with contact closing force of the order of 1 gram, unreliability in closing low voltage small current control circuits becomes a serious trouble. An investigation is in progress in the hope of finding the cause and method of avoiding such failures.

(with C. Kent Duff)

An investigation was undertaken of the conditions to be met in automatically regulating the frequency of alternators driven by direct current motors, when subject to sudden and large changes in load. Regulators have been developed, constructed and proved in service to meet the requirements in performance and reliability.

By J. E. Reid

Mr. Reid has discovered an ingenious and simple method of obtaining automatically drawn graphs of the torque exerted by any type and size of electric motor during the starting period. It will be reported in detail when proved experimentally on a variety of motors.

Under the direction of Professor V. G. Smith

The principles on which a Cathode Ray Oscillographic Wattmeter could be made to operate were studied and an investigation into the suitability for the purpose of some commercial vacuum tubes was made. This research will be continued.

A theoretical study of transformer leakage inductance and its relation to the equivalent circuits, particularly with respect to its division into primary and secondary components, was completed.

Under the direction of Professor B. deF. Bayly

A research on the analysis and synthesis of complex alternating current wave forms is in progress. The first part of this problem requires the development of a string oscillograph which is characterised by ease of operation and more accurate and comprehensive response than has been hitherto obtained. The design of the optical system is one of the main problems of such a piece of equipment. This part of the work is practically complete.

The numerical value of an integral can be found very exactly by a method due to Gauss. So far the constants have only been known up to ten ordinates. The values of these constants for twelve ordinates were calculated to sixteen significant figures. These results are of great usefulness in statistical work. They have been published.

Report on Research in the Faculty of Dentistry

Research in dental problems has been very active during the past year and although definite conclusions have not been reached in these intricate questions, still satisfactory progress has been made.

In the Department of Periodontology Dr. Harold K. Box carried out certain investigations on the physiological properties of saliva and an attempt was made to correlate these findings with the lesions known as erosion and cervical caries, and with calculus formation. Salivary enzymes concerned with the degradation of starch were studied, and the relation of these enzymes to the retention of carbohydrate debris on the teeth was investigated. A paper on the relation of the liquefying amylase of saliva and amylopectin to dental caries is now ready for publication.

Certain studies on the internal microflora of cereal grain foods as an acidogenic factor in dental caries have also been conducted in the department. The results of this investigation are to be published in the near future.

Dr. Frank M. Lott has continued his research on glass as a denture base, and on the anatomy of the temporo-mandibular joint in connection with mandibular movements. He has also made a study of the past and present conditions of the Dental Corps of the armies of Britain, United States, Australia, New Zealand and Canada to assist in the reorganisation of the Canadian Army Dental Corps.

Miss Doris Berry has continued her work on Phosphatase Activity of mixed, (resting and stimulated) saliva—clinical application of method, and also the importance of dietary correction in arrest of dental caries—clinical observations.

Dr. Elmer C. Purday and Dr. Arthur W. Ham have continued their investigation into the relationship of the mineral content of teeth to disturbances of the calcium and phosphorus metabolism.

Dr. T. C. Whang, of West China Union University, who was awarded the B.Sc. (Dent.) degree, made a study of Dental Ceramics: the composition and properties of dental porcelain together with a technique for the construction of crowns and inlays. He intends to write a text-book in Chinese on Dental Ceramics.

Dr. D. P. Sutton completed his research on the extrusive influence of epidermal processes on the teeth and alveolar tissues, and was awarded the B.Sc. (Dent.) degree.

Candidates proceeding to the B.Sc. (Dent.) degree are carrying on the following research:

Dr. Wm. Garard: An investigation to establish the relative toxicity of Monocaine and Procaine Hydrochloride, in the Department of Pharmacology under the direction of Professor Henderson and Dr. Lucas.

Dr. M. N. Rockman: An investigation of the effect of x-rays on blood, bone marrow and skin, using animals in his experimental work.

Dr. T. N. Scott who is proceeding to the M.Sc. (Dent.) degree is making a study of the anatomy and histology of the semi-edentulous and edentulous mouth.

Report of work carried on under the wind tunnel committee

A research has been conducted during the year into the effect of carrying canoes on the lower wing of a biplane. The results obtained are being tabulated and it is hoped to issue a report at an early date.

A calibration of thermometers in varying wind speeds was conducted for the Dominion Meteorological Service by Mr. Middleton of that department by use of the University of Toronto Wind Tunnel.

Certain model tests were also conducted for the de Havilland Aircraft of Canada Limited.

At the present time, tests are being made on the model of a small low wing single seat monoplane which has been designed at the University in an effort to solve the problem of a reasonably priced light plane for sport flying.

(14) PUBLICATIONS

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(15) THE REPORT OF THE DIRECTOR OF UNIVERSITY EXTENSION AND PUBLICITY

(*W. J. Dunlop, Esq., B.A., B.Paed.*)

University Extension, now completing its eighteenth year of activity, has experienced a particularly good session—in many respects, its best. 6,712 is the number of adults who studied in continuous courses or classes, whether their instruction was that which leads to a degree or a diploma or was of the sort that is taken solely with the purpose of adding to the student's intellectual equipment. As usual, this number included more men than women, there being 3,562 of the former and 3,150 of the latter.

In addition, 182 Extension Lectures were delivered by members of the staff of the University in various cities, towns, and villages in Ontario. These lectures were for the most part single lectures delivered to service clubs, or literary societies, or similar organisations, though in some cases a series of six to ten was delivered by the same professor to the same audience in successive weeks. It is difficult, really impossible, to keep a record of the number of persons who listen to these lectures but a conservative estimate would be 25,000. The Extension Lecture is generally regarded as a good, though perhaps an informal, university service because it enables thoughtful people to obtain reliable and recent information on subjects that may be of interest to them. Extension Lectures or "local lectures", as they are sometimes termed, have been available in this University since 1894. The number varies considerably from year to year, being larger in times of prosperity and smaller when economic conditions are not of the best.

Evening Tutorial Classes numbered 52 and were attended by 3,225 men and women. The subjects of instruction were: Accounting, advertising, air conditioning, camp education, chemistry, cost accounting, economics, English, French, German, gymnastics, industrial organisation, interior decoration, investments, Italian, journalism, lip reading, mercantile law, metallurgy, modern international relations, music appreciation, nutrition, parent education, psychology, public speaking, purchasing, secretarial practice, Spanish, traffic and transportation, town planning, natural history. In some of these subjects there were several classes. This is a form of extension service which might easily be extended to a greater extent throughout the Province. For these classes there are no admission requirements except mature age; there are no examinations; no certificates; degrees or diplomas. It is most gratifying that so many men and women find this type of instruction interesting and suited to their needs.

The Workers' Educational Association Classes had an enrolment of 1442. These classes, to which only manual workers are admitted, were conducted in the following sixteen localities: Brantford, Fergus, Guelph, Hamilton, Kingston, Kitchener, London, Oshawa, Peterborough, Preston, Sault Ste. Marie, St.

Catharines, Stratford, Toronto, Windsor, and Woodstock. The subjects of instruction are usually economics, psychology, public speaking, English literature and composition.

In co-operation with the Department of Social Science a short course for social workers was conducted with an enrolment of 72. It would appear that more of these courses may be required because those engaged in social service seem to be especially alert and always desirous of keeping abreast of the newest and best methods.

For the third time a week's course in Public Administration was conducted with an enrolment of 158. This course is becoming increasingly popular. The Department of Municipal Affairs of the Government of Ontario was most generous in co-operating to the utmost in providing lectures and in assisting with arrangements.

A gratifying indication of an increasing desire for education on the part of men and women engaged in business is to be seen in the fact that there were 137 students in the correspondence courses conducted for the Canadian Credit Institute; 168 in the courses conducted for the Chartered Life Underwriters' Association of Canada; and 108 in the Certified Public Accountants' Association courses. These courses constitute a valued service to the organisations which sponsor them and the arrangements are almost ideal. This department conducts the courses while the organisations mentioned conduct their own examinations and award their own diplomas.

In the correspondence courses which are prescribed as preparation for the work of the Summer Session there were 206 teachers, most of them preparing two to three subjects. In the Upper School correspondence courses there were 94 teachers, most of whom wrote their examinations in June. In the correspondence courses which are intended to assist teachers who wish to become commercial specialists there were 84 teachers. This makes a total of 797 students taking correspondence courses of some kind with this department.

In the summer courses in pedagogy, which are nominally included in our Summer Session, there were 107 teachers.

The two-year diploma courses in Occupational Therapy and in Physiotherapy are proving to be, in every respect, satisfactory. These are difficult courses, for which the admission requirements are the same as for courses in Arts, and they provide the training necessary for positions which qualified young women find interesting and remunerative. These are the only courses of the kind in Canada. They are probably unique in the fact that, according to information given me, there is not a qualified therapist, a graduate of this course, who is unemployed. Indeed, the demand for these graduates still exceeds the supply.

Every year there is something new in University Extension but one of the oldest of its activities, the Pass Course for Teachers, never fails to attract its quota of ambitious teachers and remains, throughout the years, a most substantial and enduring piece of work. In November, nine graduates of this course were awarded the degree of Bachelor of Arts and at the June Convocation there were 35. A graduating class of 44 would not be considered small in some colleges in Canada. There were 908 teachers, and others, enrolled in the Summer Session and in Teachers' Classes during the year now closing. A Teachers' Class was held in Brampton, the subject being first year economics, and the results of the examinations were particularly good. In order to make a beginning in serving teachers in that part of North-Western Ontario, which has its centre at Port Arthur and Fort William, a Teachers' Class was commenced, under a special arrangement, with ten students. Many others wished to enrol but lacked some part of the admission requirements. The ten students worked so faithfully in first year pass English, under the tuition of a graduate of this University, that every one of them was successful at the May examinations, three taking (A) standing and two (B) standing in the subject. The Pass Course for Teachers offers a wonderful opportunity for study with a definite goal in view. Men and

women who are not teachers may take advantage of the facilities offered to take the instruction and to write the examinations required to obtain a B.A. degree which is of a standard exactly the same as that of the Pass Course in Arts in this University.

Each year brings, as has been said above, something new in University Extension. This year it has been the establishment by the Senate and the Board of Governors of a two-year diploma course in Aerial Navigation which was recommended by the Committee on University Extension. Like the two-year diploma courses now available for young women, this new course will provide an opportunity for young men to obtain training which should fit them for posts which are and will be numerous. This is the first course of its kind in Canada. Already nearly one hundred applications have been received but it is hoped that it may be possible to limit the first class to 25.

University publicity has been carried on as in previous years. Announcements in the newspapers from time to time (almost daily), articles written for newspapers and other periodicals, the exhibit at the Canadian National Exhibition, the placing of the university's advertising, visits to normal schools and collegiate institutes, are the principal features of this work. As always, the daily and weekly newspapers and the Canadian Press have given cordial co-operation at all times.

University extension and university publicity are so inter-locked and inter-related that one is often merely the expression of the other. The underlying principle is that the citizens of Ontario, the proprietors of this University, should know what the University offers them and should be able to take advantage of what it offers if they care to do so. Every man and woman in Ontario could study with the Department of University Extension if he or she had the inclination and were willing to engage in the type of study peculiar to the function of a university. University Extension does what it can to disseminate knowledge. Interest is the basis of education and it is gratifying to realise that so many thousands of adult men and women are anxious for a glimpse into the sphere of higher learning. To meet the needs of such men and women, to give adults who require it a "second chance", to enable others to improve their academic and professional status—such is the chief function of University Extension.

(16) REPORT OF THE DIRECTOR OF THE DEPARTMENT OF SOCIAL SCIENCE

(Professor A. E. Grauer, Ph.D.)

This year marked a change in the directorship of the Department; but the blow of Professor Urwick's retirement was softened by his willingness to continue with his previous lecture courses. Thus staff and students alike are still able to enjoy his wise counsel and inspiring words.

The Department was strengthened by the promotion of Mr. D. G. McCullagh from a part-time to a full-time member of the staff. Mr. McCullagh will act as supervisor of group work studies and his presence will mean that this rapidly developing field of social work will receive more attention in the future. In the field of medical and psychiatric treatment, Miss Emory and Miss Millman of the School of Nursing have cooperated in giving a badly needed new course on the health aspects of social treatment; and Dr. H. Cruikshank delivered a valuable series of lectures on the social problems occasioned by disease, a series which he has consented to give regularly in the future.

The Department strengthened its relations with social welfare agencies in the province by organising an evening refresher course throughout the winter months in cooperation with the Canadian Association of Social Workers and the Department of University Extension, and is continuing this policy by arranging,

in cooperation with the Department of University Extension, for a short course in case work during the summer for qualified social workers under the direction of a leading American case worker. The Department feels that such activities are but a small return for the many things that the public and private agencies do for it, especially the valuable voluntary supervision given the students in field work.

A survey of job-turnover, age-distribution, income-distribution, and other important facts relating to the employment of social workers throughout Canada was begun in December and will be completed by the summer. This information will be of value to those intending to enter welfare work as a career, as well as to social workers in the field.

There were 64 students registered in the Department this year, divided as follows: 25 in the first year, 16 in the second year, and 23 occasionals. It is interesting to note the national character of the enrolment; 22 students were from the four western provinces, and six from those east of Ontario. Students were in attendance from every province in Canada except Prince Edward Island and New Brunswick.

(17) REPORT OF THE DIRECTOR OF THE SCHOOL OF NURSING

(Miss E. K. Russell)

Five years ago the School was established for the purpose of organising an adequate training course in public health nursing and it has taken all of this time to get this new work well started. A good beginning has been made and order is appearing now out of chaos, but long and patient study lie ahead if this School is to proceed satisfactorily. The nature of the work which we call public health nursing must be better understood before we can afford to be dogmatic about the education and training of the worker. Thus the School should continue quietly with the research upon which it has started. The School was given, first, a trial period of five years which is now ended, and arrangements have been made to proceed with continued financial help from the Rockefeller Foundation. Permanent endowment is required in order to get the institution properly established: it is hoped that there will be much understanding of the need for well prepared public health nurses so that this necessary support will be forthcoming. Students are enrolling in the new course in increasing numbers although registration must be restricted because of the very limited accommodation at the disposal of the School.

This new course resembles in type certain courses that are being given in several European schools but it is a type that is strange and little understood, as yet, in this country. Hitherto the prospective public health nurse has prepared herself for her task by taking a post graduate year at the end of three years of hospital training. Now this School is offering a basic training course so organised that it becomes a well-sustained preparation for public health nursing throughout the three years of its extent, while, at the same time, a thorough training in bedside nursing is interwoven with this as an essential part of the whole.

The certificate courses for graduate nurses continue to develop satisfactorily and to attract students in increasing numbers. The large enrolment in these classes is straining the small resources of the School.

The statistical report for the year is as follows:

Undergraduate course	33
Graduate nurses in the certificate courses	73
Occasional students, including undergraduates from Toronto hospitals	173
Enrolment in refresher courses	187

(18) REPORT OF THE DIRECTOR OF THE DEPARTMENT OF MILITARY STUDIES

(*Major M. Barry Watson, B.A.Sc., C.E., M.E.,*)

I have the honour to report as follows on the work carried on in this Department during the academic year, 1937-38.

Due to the fact that this subject is an option for academic credits in the pass arts course and two years of the course in medicine only, and that time table arrangements did not permit of students in the latter course taking this option, the number of students taking Military Studies as an academic subject was small.

The enrolment in the special classes (Courses 4 to 7 in the Calendar) however, was gratifying in view of the fact that these classes are voluntary, extra to the curricula and regular time table periods. The total registrations in all classes was 136.

This voluntary enrolment is no doubt due to the realisation by a considerable proportion of the student body that Canada must carry her share of the defence burden of the Empire, as well as to the large number of professional opportunities now offered for men of university standing in the defence forces of the Empire. Students in these special classes may obtain, concurrent with their university courses, through the Canadian Officers Training Corps, and the War Office in London, qualifications for commissions in various forces throughout the Empire. The relative numbers taking this extra work also indicates that the inclusion of Military Studies as an optional subject in other courses would be well received by the male students.

Attendance has been well maintained in all classes throughout the year, and the interest displayed was most encouraging. The attendance at the various courses of lectures overtaxed the capacity of the available quarters, and rooms in the engineering building were used for this purpose.

The results of the War Office examinations held in March, 1937, for qualification for commissions in the defence forces, showed 76 per cent of the candidates being successful; which retains the position of this University as above the average of all Canada and all Great Britain. The actual number of successful candidates being exceeded only in the University of Alberta.

Due to the increasing preference for university men, especially Canadians, as officers in the Regular Army and Air Force, and the very attractive conditions offered, a number of our graduates are adopting military work as a profession.

Some changes in the curriculum in this Department are being introduced which it is expected will enhance its value. These include the substitution of more work in military history and the geography, trade and economics of the British Empire, replacing the more detailed tactical and strategical studies.

(19) REPORT OF THE UNIVERSITY HEALTH SERVICES (MEN)

(*George D. Porter, M.B., Director*)

I.

The report of the year shows that there have been

Examinations:—

First year students	858
Second " "	728
Senior " "	710
Total	2296

There were also fifteen re-examined by specialists.

This is the largest number so far examined due to the extra number of senior students coming in for health certificates.

The results of the examinations this year were very satisfactory. The physical condition of a large majority of students is excellent, only nineteen being unfit for physical training. This is the best record we have ever had.

Results:

Those found fit for physical training	96%
Those having some disability requiring corrective or light exercises	2½%
Those unfit for physical training	1½%

Nineteen students were exempted for the following causes:—

Operations	7	Duodenal ulcer	1
Infantile paralysis	2	Arthritis	1
Heart trouble	5	Nephritis	1
Spinal trouble	1	Osteomyelitis	1

The average height of our first year students is 5 ft. 9¾ in. and their weight 144½ lbs. This makes our highest average.

It may be interesting to note that our freshmen stand first in height as compared with those of eleven American Universities, and second in weight, and that the general upward trend in height and weight is very noticeable in the past sixteen years.

Improvement in the physical condition of the second year students is shown in the majority of cases. Twenty-eight per cent of those below category A.I. in their first year had their rating raised during the year, while only five per cent in all categories had their rating lowered; these latter were lowered owing to illness or accident during the year.

The great majority of senior students coming in for examination for athletics also show improvement in their physical condition. We were very fortunate in having no cases of infantile paralysis or any other serious infectious diseases during the year, and apart from the usual, but comparatively mild epidemic of influenza, the general health of the student body has been excellent.

There were 105 students enrolled in the special classes under Mr. Martin, for the correction of such defects as round shoulders, flat feet, and spinal curvature, and 55 others for periods of from one to six weeks on account of injuries or disabilities, and those recovering from illness which prevented their taking the regular P.T.

Dr. Charles Gossage attended a large number of students for injuries received on the campus, and in the gymnasium, as will be seen in his report to the Athletic Association.

Personal advice to many students, and lectures on personal hygiene to those in the first year taking physical training, were given by the Director of Health Service. These were well attended as they have been in previous years.

We are greatly indebted to Prof. Andrew Hunter, professor of pathological chemistry, for undertaking the supervision of the uranalysis, in connection with the physical examination of the students.

Illnesses and accidents for which temporary absence from physical training were allowed. This is the best record we have ever had regarding exemptions, and noteworthy for the absence of serious infectious diseases.

Colds	241	Mastoid	2
Influenza	16	Torticollis	1
Bronchitis	2	Transfusion	1
Pharyngitis	18	Lumbago	3
Laryngitis	5	Jaundice	3
Tonsillitis	3	Local Infection	9
Sinusitis	5	Ingrowing toe nail	2
Gastritis	9	Cardiac	1
Neuritis	1	Dental trouble	5
Appendicitis	4	Hernia	1
Migraine	4	Nephritis	1
Epistaxis	3	Vaccination	1
Otitis Media	4		30
	315		

Operations			
Tonsils	4	Foot	1
Nasal	3	Glands	1
	7		2
Injuries			
Fractures	5	Sprains	36
Dislocations	5	Cuts	2
Abrasions	9	Contusions	7
	19		45
Skin Diseases			
Furunculosis	15	Acne	1
Scabies	1	Athlete's foot	1
	16		2

Total.....436.

(19) REPORT OF MEDICAL ADVISER OF WOMEN

(*Dr. Edith Gordon*)

II.

I beg to submit the report of the Medical Adviser of Women for the year 1937-1938.

The work of the Medical Office began early in September, and continued through to nearly the end of June. Physical examinations of the students of the School of Nursing necessitated the early opening and late closing. Their term begins before that of the University proper, and re-examinations are made at the end of the year on all the undergraduate group.

Physical examinations were made on entering students in University College, Medicine, and Household Science to the number of 214. These young women are required to take physical training during the first year of their attendance. Of these, 83.2% were fit and able for the gymnasium and swimming requirements; 2% were asked to attend one or two special corrective classes weekly for a part or the whole of the year. Re-examinations were made of these students in January. Only 5.6% were exempted from physical activities of some kind, because of temporary or permanent disabilities. This group reported twice weekly to the medical office for rest periods or walks. In this way the first year students most needing it, were given the closest supervision. 306 students from the other years of University College, Medicine and Household Science, as well as from Trinity, Victoria and St. Michael's Colleges, and other faculties and departments were examined. Included in this group were 66 women of the graduating class who responded to an offer for a re-examination before leaving college. For some years the Medical Adviser of Women has been attempting to interest all the women of the graduating class in such a check over in the spring of the year. This year saw the largest response so far. Of these 62% showed some improvement over their physical condition on entrance; 14% showed no appreciable difference; and 24% were not in as good condition as on their initial examination.

Participants in the various sports are required to present to their managers a certificate of physical fitness before taking part in the games. 226 such certificates were issued after examining the would-be players.

Intercutaneous tuberculin tests were performed on all the entering students, and on those whose previous test had been negative. 43.6% gave positive reactions. These were X-rayed. The filming was done in the department of anatomy. I am indeed grateful to Dr. Grant and his staff for their cooperation in this work. Two cases of active tuberculosis were discovered. These were entering students, and both are at present in sanatoria undergoing treatment.

With the help of the five young women in the final year of the Diploma in Physical Education course, and one young woman from the fourth year of the Faculty of Medicine, a beginning was made on a study in posture using the line of gravity apparatus which was built some years ago for Dr. Cates of the department of anatomy. This work proved most interesting, but was too time-consuming to permit the attention it merited. A graduate in physical education could well give a year to investigation on this problem.

Another interesting study was provided through the courtesy of Dr. B. L. Guyatt of the department of anatomy. He arranged for a high vitamin and chlorophyll product in sufficient quantities to give to students whose haemoglobin was 70% or lower, and who were not, or did not wish to be under treatment elsewhere. More than 50 students were included in this group. Haemoglobin, red cell count and differential count were done monthly on those taking the product. The result in many cases was gratifying and in a few instances was almost spectacular.

In the spring of the year, the Medical Adviser was approached by Miss Helen McMurrich of the extension department, and Mr. Thos. Cole, the representative of the Northern Electric Co. for their hard of hearing appliances and audiometers, with the suggestion that a survey be made among the women students to discover the percentage of hard of hearing. Through the courtesy of Miss Coventry who gave over a physical training class period for this work, and Miss Russell of the School of Nursing who arranged to have the post graduate students given the opportunity for being tested, 142 were tested. 106 were undergraduates, and 36 were graduates. Of these, 27 of the undergraduates showed a distinct loss of hearing in one or both ears, and 15 of the graduate nurses were similarly affected. I am hoping to include this hearing test in the regular entering examination next fall.

The number of students coming into the Medical Office daily for consultation re health problems, and for treatment for minor ailments continues to be large. 36 vaccinations were performed, and 160 urinalyses were made.

During the final examination period in May the Medical Office cares for students who are too ill to write their papers in the regular examination halls. 61 women students wrote papers in the medical office, and 160 papers all told were written.

Lecture courses were given to the students in the Diploma in Physical Education course. To the first year, 25 lectures in personal hygiene and first aid were given. In addition to the final tests by the Medical Adviser, this group tried the examinations of the St. John Ambulance Association, and all passed successfully. To the fourth year, 20 hours of lectures and demonstrations in the diagnosis of physical defects were given. Three health talks were given to the entering women, following the completion of their physical examinations, and based upon their findings. In March, four lectures in personal hygiene were given to the Public Health Nursing class.

It was a great disappointment to realise that the erection of the Women's Gymnasium Building had again to be postponed. The need of adequate accommodation for physical training and recreation for the women is so pressing that it can hardly be too much emphasised.

Physical Examinations, 1937-1938:

University College (entering students)	181
University College (others)	79
Victoria College	37
Trinity College	28
St. Michael's College	12
Medicine (entering students)	12
Household Science (entering students)	21
Household Science (others)	2
School of Nursing (undergraduate)	25
School of Nursing (postgraduate)	67

Social Science	30
Physiotherapy	5
Occupational therapy	6
College of Education	2
Graduate School	6
Optometry	2
Special	5
Total	520
Margaret Eaton School	53
Grand Total	573

Students required to take Physical Training: first year University College, Medicine, and Household Science 214
Grades A1 and A2; physically able to participate in the required gymnastic and physical activities 83.2%
Grade B1; needing special corrective work 11.2%
Grades B2 and C; excused from physical training requirement because of some temporary or permanent disability. These students report twice weekly to the Medical Office for rest periods or walks 5.6%

Senior students of University College and Household Science who were examined in the spring of 1938. Compared with their examination upon entrance to the University.

Showing improvement ..... 62. %
Showing no improvement ..... 14. %
Showing retrogression ..... 24. %
Total examined ..... 66.

(20) REPORT ON ATHLETICS AND PHYSICAL TRAINING

(T. A. Reed, Mus.Bac., Secretary, Athletic Association)

(1) MEN

I have the honour to submit the following report on the activities of the Department of Athletics and Physical Training for the season 1937-38.

The work has followed the usual course under the able supervision of Mr. Warren Stevens, our director of athletics. In this he has been loyally supported by the regular instructors, Messrs. W. H. Martin, J. E. McCutcheon, W. W. Winterburn and Charles Zwygard.

A most gratifying feature has been the greater interest and participation in our intramural programme initiated last year and now being developed under Mr. McCutcheon to a greater degree of efficiency and participation. The opening of the Gymnasium and Swimming Pool in the evenings has meant a greater number availing themselves of the facilities and allowing for more group competition in the indoor activities. 1555 male students or 45 percent of those eligible participated in this programme. The Committee in charge, consisting of the presidents of athletics in the faculties and colleges with W. M. Sprules (Trin. III) as Chairman, proved a most valuable advisory council to the Athletic Directorate in the administration of the intramural programme.

The imposing of an athletic fee by the Board of Governors was also attended by satisfactory results. The privileges granted the students, both men and women, were varied. Of prime importance was the opening of the Gymnasium and Swimming Pool in the evenings, the expenses being met by the Athletic Association out of receipts from that fee. This removed a grievance long felt by the senior men in the professional faculties where, due to long hours in laboratory work, they could not reach the Gymnasium before closing time. Other privileges made possible by the fee were admission to all university rugby and hockey games; to the outdoor skating rink each afternoon and two evenings a week; instruction in figure skating and golf; affiliations with a golf club and riding club for reduced fees and accommodation for skiing during the winter months.

Physical Training

The number of students in the first and second years taking Physical Training was slightly smaller than the previous year. In addition to the Danish gymnastics, upon which the training is based, gymnastic apparatus and mat work was included. The urging of first year students to learn to swim and qualify for the Royal Life Saving awards was reflected in the increased number joining these classes. Enrolment in our contingent of the Canadian Officers Training Corps again proved popular, there being a slight increase in the number voluntarily choosing this as an option.

Enrolment

Men students in the first and second years		1761
From third and fourth years (being deficient in previous years)		21
		1782
From this total must be deducted those:		
(*a*) With credit for two years physical training but repeating academic work	206	
(*b*) Exempt on medical and other grounds	43	
(*c*) Withdrawn from college during the session or registration cancelled	23	
(*d*) Failed to register	13	
		285
		1497

These 1497 elected to take their Physical Training as follows:

In Physical Training classes	1074	
In the Canadian Officers' Training Corps	215	
In Special Classes for those physically deficient	87	
In the following Intercollegiate and Interfaculty Sports (part-time):		
Rugby	198	
Soccer	41	
Track and Harrier	98	
English Rugby	5	
Lacrosse	35	
Volleyball	99	
Boxing, Wrestling & Fencing	44	
Swimming & Water Polo	88	
Indoor Baseball	161	
Basketball	190	
Hockey	177	
Rowing	33	
Gymnastics	31	
Tennis	4	
Figure Skating	7	
Jui Jitsu	13	
	1224	
	2600	
Less those participating in two or more activities	1103	
		1497

There were twenty-five class periods each week in the Gymnasium, of which the majority were conducted by Mr. Chas. Zwygard. The average class attendance was 44 although some were as high as 135. The programme consisted of Danish calisthenics, elementary apparatus, games and mat work. Mr. Martin conducted special classes for the 87 students physically unfit to take the more strenuous work in the Gymnasium. Mr. Martin also supervised the instruction in boxing, fencing and wrestling. In swimming Mr. Winterburn conducted 251 Learn-to-Swim classes or 11 per week. 185 students were taught to swim, 59 students were enrolled in the intermediate classes of which there were 3 per week and 434 in the 20 life saving classes. There were 225 awards granted by the Royal Life Saving Society. Mr. Winterburn also supervised the water polo competitions in the Intramural programme and the various swimming meets, besides acting as assistant coach of the University swimming and water polo teams.

Intercollegiate Athletics

The University of Toronto was represented in all branches of intercollegiate sport. The senior championships were the track, tennis, English rugby, golf, swimming, gymnastics and the boxing and wrestling. The individual Gymnastics championship also was won by W. J. Lester, (Ap. Sc. II) of Toronto. In boxing and wrestling we again retained our own "Tom Gibson Cup" and in Track competition wrested from McGill the Tait Mackenzie Trophy after their seven years of unbeatable superiority.

During the year the Athletic Association decided it was high time to recognise the valuable services of Mr. Charles Walters who, for the past twenty years has given gratuitously of his time and talents to promote the cause of intercollegiate fencing. It was therefore decided to offer to the Canadian Intercollegiate Athletic Union a trophy for team competition in senior fencing and a smaller individual trophy for the fencer winning the highest points at the annual intercollegiate meet. Both these trophies bear the name of Charles Walters. The individual championship was won by A. L. Garcia, (Ap. Sc. II) of Toronto and the team championship by McGill University.

Of intermediate championships we won the soccer, tennis, hockey, basketball, swimming and fencing.

In addition to our annual competition in the Canadian Intercollegiate Athletic Union, several of our senior teams continued the pleasant athletic relationships established with many U.S. Colleges. The hockey team met Harvard, Yale, Princeton and Dartmouth, as well as the two leading teams of the mid-west, University of Minnesota and University of Michigan. The heavy crew completed their season by rowing against Syracuse University. In basketball we competed with Cornell, Syracuse, Buffalo, Rochester, Assumption, Detroit, Canisius, St. Lawrence, Clarkson and Niagara. The boxing, wrestling and fencing teams met the U.S. Coast Guard Academy, Cornell, Alfred, Rochester, Buffalo, St. Lawrence and Wayne. The swimming team had a fine year meeting Rochester, Syracuse, Buffalo and Canisius. The English rugby team enjoyed a fast game with the Chicago Rugby Club and the lacrosse team ended the season by meeting Dartmouth, Syracuse and Springfield. The international fraternising was of inestimable value both as to experience and in upholding the honour of our University in contests across the border.

Intramural Competition

The schedule herewith indicates the interest on the part of the students, for while 284 represented the University in intercollegiate competition, 1372 men turned out on college and faculty teams.

Series	Name of Cup	Winner	Interfaculty teams	Players
Rugby	Sir William Mulock	Victoria	10	257
Track	W. L. Rowell Memorial	S.P.S.		45
Soccer	Arts Faculty	Victoria	10	153
Harrier	J. Brotherton	Wycliffe		51
Hockey	W. T. Jennings	Victoria	17	265
Basketball	Clifford Sifton	Med. III	22	314
Lacrosse	Dr. W. A. Dafoe	Sr. S.P.S.	9	105
Sr. Boxing, Wrest. & Fencing	Francis Davison	S.P.S.		44
Jr. Boxing, Wrest. & Fencing		S.P.S.		67
Indoor Baseball	A. G. Spalding	Dents	21	369
Sr. Swimming	A. M. Fitzgerald	S.P.S.		48
Jr. Swimming		S.P.S.		61
Water Polo	H. P. Eckardt	Sr. Vic.	11	149
Indoor Track	Toronto Cricket Club	Victoria		75
Tennis	F. Y. McEachren (for University champion)	W. P. Pigott (S.P.S. III)		37
Gymnastics	H. A. Wilson	S.P.S.		27
Volleyball	Victoria College Staff	Dents	18	224
Individual Swimming	H. Durnan	G. H. Clawson (U.C. I)		16
				2307
Less those participating in two or more sports				935
Number of contestants				1372

Special Awards

The John C. H. Copp Memorial Trophy, awarded each year to the worthiest member of the senior rugby team, was won by C. C. (Cam.) Gray, Med. V, an outstanding member of last year's team. The Don Barton trophy, established in memory of our former physical director, and awarded annually to the gymnast showing the greatest improvement during the year, was awarded to L. A. Patterson (Ap. Sc. II).

In the summer of 1937 one of our most promising students and athletes, T. H. Bickle, Trinity class of '38, lost his life by unselfishly going to the assistance of some friends. During the session his parents established a Bursary to bear his name which was, by unanimous decision awarded to M. W. Murphy (U.C. '35) of Wycliffe College, a team mate and member of the senior intercollegiate swimming team.

The Varsity Arena was again used during the summer for the Promenade Symphony Concerts which now, in the fifth year of their existence, have become established in the musical life of the community. It has afforded facilities for a great mass of people to hear symphony concerts for the small sum of 25c. There were twenty concerts given with an average attendance of 4500 people. As the charges for the building are placed at the lowest possible figure to cover out of pocket expenses, it means that the University is continuing to contribute generously to the musical life of Toronto.

The Athletic Directorate

The Athletic Directorate for 1937-38 consisted of Dr. J. A. McCollum (President), Professor T. R. Loudon, Professor S. Beatty, Dr. W. Easson Brown, Messrs. M. F. Williams (Vice-President), J. P. N. Holden, L. G. O'Connor, H. B. Shipman, T. W. Sullivan, E. B. Tovee, and *ex officio*, Dr. G. D. Porter, Medical Director; Warren Stevens, Director of Athletics and T. A. Reed, Financial Secretary.

(20) REPORT OF THE DIRECTOR OF PHYSICAL EDUCATION FOR WOMEN STUDENTS

(*Miss I. G. Coventry*)

(II) WOMEN

In the past academic year 1937-1938 there were 238 women students registered in the physical education classes and approximately 787 class periods of instruction were given by the Physical Director and her assistant Miss J. M. Forster and Mrs. M. Graham.

Required Physical Training: The required physical training class with an enrolment of 216 students was subdivided into 15 class periods a week. This plan, as formerly, assisted principally in accommodating the students who presented varied academic time-tables and also lessened the congestion in the one small gymnasium and the over-crowded dressing-room quarters.

The students enrolled in the regular classes were required to take the final tests in general gymnastics and corrective exercises at the end of the year. The annual report of these examinations was submitted to the Registrar of the University.

Corrective and Remedial Classes: Class periods of corrective and remedial gymnastics were given to the students who were medically advised to take the special course arranged for their benefit and welfare. The Physical Director personally supervised this essential part of health physical training. Frequently such good results were obtained that it enabled the students to return to the regular classes.

Number of students from University College	192
" " " " Faculty of Medicine	15
" " " " Faculty of Household Science	6
" " " " Victoria College	3

Swimming: There were 212 students from all colleges, faculties and departments and over 240 periods of instruction in elementary and advanced swimming and life saving given by Miss A. Cochrane and Mr. A. L. Cochrane during the session of 7 months.

Number of students from University College	123
" " " " Victoria "	21
" " " " Faculty of Medicine	7
" " " " Physical Education Course	23
" " " " Faculty of Household Science	6
" " " " Trinity College	2
" " " " School of Nursing	4
" " " " Social Science	2
Administrative Staff	24

Four Year Diploma Course in Physical Education (with the Pass Arts course): There were 24 students registered in this course and approximately 722 class periods of lectures, theory and instruction were given during the college year. Periods of theory subjects numbered 272 and of practical subjects 450.

The women graduates who have been granted the diploma in physical education by the University of Toronto continue to be appointed physical directors or instructors in the Ontario schools.

(20) REPORT ON ATHLETICS FOR WOMEN

(*Miss A. E. M. Parkes*)

III.

The Women's Athletic Association is happy to report a considerable increase in participation in athletics by the women undergraduates for the year 1937-38. This is particularly noticeable in the recreational sports which do not involve organised competition. This development may be traced almost entirely to the increased facilities provided by the new athletic fee which has been welcomed by the women as well as the men. Due to the affiliations made with golf and riding clubs, it became financially possible for a large number of women to enjoy these forms of exercise. Similarly the skiing grounds and cabin were much appreciated. Class instruction in figure skating and golf was also provided and approximately twenty-five women enrolled for each course. An amount proportionate to that used to keep the athletic wing of Hart House open at night was turned over to the Women's Directorate. It was decided by that body that the major portion should be held in trust to be used for certain purchases of athletic equipment, etc., which would become necessary when a new women's athletic building is erected. With the remainder, bowling alleys were rented and made available to women students at a minimum charge. Afternoon hours only could be obtained which limited the numbers, but approximately forty students bowled for one hour a week for ten weeks under the scheme.

The regular programme of competitive sports was carried out as usual and provided great enjoyment for all participants. In the field of intercollegiate sport, championships were well divided, Western retaining the basketball, while Queen's won the tennis, with McGill providing the individual champion, and McMaster won its first intercollegiate championship of any kind in the newly-organised badminton tournament. Toronto won a sweeping victory in the swimming meet, coming first and second in all events and setting four new records.

Within the University, tournaments in tennis, badminton and swimming were conducted by each college in addition to the regular intramural competition. A golf tournament was held in the fall as well as the intramural series in basketball

and baseball, and the hockey series was conducted in the winter term. Students taking part in one or more of these activities or in the bowling tournament were registered in University, Victoria, Trinity and St. Michael's Colleges, the Faculty of Medicine, the School of Nursing, the Departments of Household Science, Occupational and Physiotherapy and Physical Education. Several students registered in the Ontario College of Education and in the Department of Physical Education also acted as coaches. Championships were much more evenly divided than last year, with Victoria retaining the tennis and baseball and University College the swimming, while St. Hilda's won the hockey and University College the badminton. The championship most generously applauded by all concerned was that won in basketball for the first time by St. Michael's College.

In the actual intramural competitions sponsored by the Association, entries were as follows: tennis, 30; basketball, 130; hockey, 58; swimming, 48; badminton, 30; baseball, 27; bowling, 40; golf, 16.

The women are indebted to the men's Directorate and to officials of the Athletic Association and the Superintendent's Office for assistance and co-operation on many occasions.

The Women's Athletic Directorate for the year 1937-38 consisted of Dr. C. C. Benson, President, Mrs. W. A. Kirkwood, Mrs. W. B. Elsley, Dr. Edith Gordon, and the Misses J. M. Forster, M. E. Best, M. J. Brownlee, M. F. Davidson, M. I. McLaughlin, K. G. Mayes, J. A. Rea, and A. E. M. Parkes, Financial Secretary.

(21) REPORT OF THE ACTING WARDEN OF HART HOUSE

(*Mr. J. R. Gilley*)

The Warden

During the summer of 1937 Mr. J. B. Bickersteth had a recurrence of the illness from which he suffered for several years after the war and on the advice of his doctors in England did not return to Hart House last September. He was granted leave of absence for the academic year 1937-1938 and it is gratifying to know that he has now almost regained his health and will be able to resume his duties in August. For seventeen years Mr. Bickersteth has whole-heartedly flung himself into the life of Hart House. His energy and devotion to the affairs of the House are reflected in the steady growth of its various activities during this period. In view of the absence of the Warden it was inevitable that the life of the House would suffer a severe blow. This handicap, however, has been overcome to a certain extent by the willing and sincere co-operation of the various committees and all members of the staff.

General

The opening of the University in September was postponed one week on account of the poliomyelitis epidemic which made necessary the change of date or the cancellation of various meetings and functions. The Massey Foundation continue to show keen interest in all phases of the life of the House. Realising that for some years the Faculty Union required additional accommodation, the Foundation generously provided funds for the construction of a new sitting-room on the third floor, for the much needed renovation of and new equipment for their serving room and alterations in their dining-room. These improvements are greatly appreciated by all members of the Faculty Union.

A unique gift in the form of a historical and pictorial map was formally presented to Hart House by Mr. Vincent Massey on behalf of the Massey Foundation in October 1937. This map 6′ x 5′ is an excellent example of the work of the well-known artist, Mr. A. Scott Carter. Done in vivid colours it presents a complete survey of the University property and includes the heraldry

of various colleges, benefactors and persons connected with the University. Another acquisition was a plaster representation of the coat of arms of Canada, with its heraldic supporter, which formed part of the decoration of the temporary building known as the annex erected at the west end of Westminster Abbey for the Coronation of Their Majesties King George VI and Queen Elizabeth on 12th May 1937. It was presented by H.M. Office of Works to Mr. Vincent Massey and was given by him to Hart House, having now found a place in the debates room.

For several years it has been known that the accommodation in Hart House for the Students Administrative Council has been totally inadequate and steps have now been taken to enlarge these quarters by the addition of the room immediately to the west of their present location: at the same time the partition between the new room and that occupied by the General Secretary-Treasurer of the S.A.C. has been removed. This necessitated alterations to the Hall Porter's desk and the room adjoining it. The expense of these structural changes has generously been borne by the Board of Governors.

There was a slight increase in the membership of Hart House during the past year, there being 3717 undergraduate and 726 senior members with a total of 4443. The Shop where light refreshments and sundry articles are sold had a most satisfactory year. An additional room in which students may eat their lunches was provided and it with the other two were decorated in attractive colours. As in past years many large and small functions were held during the winter including the Engineering Society Dinner, the Athletic Association Dinner, the University College Follies, School Night, Alumni Night, the Faculty of Forestry At-Home, the Trinity College Conversazione, the Commerce Club Dinner, the Law Club Dinner and the C.O.T.C. Ball. The tickets for the Graduates Ball on New Year's Eve were in good demand which showed that this annual function still retained its popularity among the senior members of the House. The first Visitors' Day of the term in October was as last year for the general public as well as for members of the House and over 1500 persons availed themselves of the opportunity to make a tour of the building. Again this year the University Settlement Party was held in the last week of the Michaelmas term when about 300 men and boys were the guests of Hart House. At the Warden's Christmas Dinner held on the first evening of the Christmas vacation approximately 70 men, all of whom would not be spending any part of their vacation at home, were in attendance.

Art

An exhibition of the work of Mr. A. Y. Jackson and Mr. E. H. Holgate opened the series held in the art gallery during the academic year. Other exhibitors were Professor Barker Fairley (a faculty member of the House), Mr. F. S. Panabaker, Mr. Bertram Brooker, Mr. L. F. Casey, Mr. A. J. Casson, Mr. André Bieler, Dr. Gordon Pearson and Mr. Louis Muhlstock. Among the members great interest was shown in the paintings of these artists as there was also in the photographic exhibition arranged by the Camera Committee. The exhibition in February of work done by the undergraduates included drawings and paintings together with a mural executed in the arts and crafts room under the supervision of the instructor, Mr. Carl Schaefer, and etchings, lino-cuts, wood-carving and sculpture also done there. The graduate members and members of the faculty showed their work in the gallery in March when several exhibitors, formerly unknown to the committee as artists, showed their work for the first time. Reproductions of paintings by landscape artists as well as those by Spanish, French and Modern Masters were shown in the print room. On two occasions Mr. Arthur Lismer reviewed exhibitions in the gallery—the first being that of children's work done at the Art Gallery of Toronto and the other that of the work of the undergraduates. This was the first time that the

undergraduate exhibition had been reviewed and this event drew about one hundred students to the gallery to hear the criticisms of Mr. Lismer. After Christmas Mr. André Bieler and Dr. Gordon Pearson each reviewed his own pictures while on view in the gallery. Mr. H. S. Palmer again conducted the weekly art class in which nineteen members were enrolled and attended regularly. Mr. A. Y. Jackson and Mr. F. H. Brigden were re-appointed for a three year period as the Advisory Committee of Artists. On their recommendation two pictures—"Draped Head" by Jack Humphrey and "The Saw Mill" by André Bieler—were added to the Hart House collection. Through the courtesy of its Director, Mr. Eric Brown, the two sketches by Tom Thomson were repaired at the National Gallery during the past summer and at present four canvases are there for cleaning and minor repairs. It was found necessary to add a section to the bookcase in the gallery to accommodate the art library to which additions are made from time to time through gifts and as funds become available for this purpose.

MUSIC

As in the past the Sunday Evening Concerts held during the year were exceedingly popular and on the occasion of each concert the Great Hall was filled to capacity. We are indebted to the following musicians for the programmes: Mrs. Wilma Stevenson Dohler, Mr. Albert Pratz and Mr. Leo Barkin, Mme. Emmy Heim, the Hart House String Quartet (on their return from an extensive European concert tour), the Hart House Glee Club and Miss Margaret Oliver, and the Conservatory String Quartet (using viols and modern instruments) with Mr. Alberto Guerrero (playing the harpsichord). The Friday Afternoon Recitals attracted a large number of students. These informal recitals provide all members of Hart House—undergraduates, graduates and members of the faculty—with an excellent opportunity to acquaint themselves with and to enjoy chamber music in an ideal setting. During the past winter Sir Ernest MacMillan, Mr. George Lambert, the Toronto Trio, Mr. Viggo Kihl, Miss Marion Copp, the Philharmonic String Quartet and Dr. Harvey Doney were among those who contributed to the success of the recitals. Under the direction of Mr. J. Campbell-McInnes the Songsters had a splendid season with a most satisfactory attendance. Members are deeply grateful to Mr. Ross Workman who has so ably conducted the popular Midday Sing Songs. To the musicians of Toronto who through their generosity have made possible such outstanding musical events in the life of the House during the past academic year is owing a real debt of gratitude. Under the direction of Dr. Charles Peaker the Hart House Glee Club has developed at the same time maintaining their membership of one hundred men. Before the close of the first term the club sang carols one evening during dinner in the Great Hall and in February with Miss Margaret Oliver (pianist) they performed at a Sunday Evening Concert. In addition to these two functions they sang on several occasions outside the University.

DEBATES

Again five debates were held during the year when the motions before the House dealt with the influence of the rearmament of Great Britain on peace, the effect of the expansion of Japanese foreign trade on the Far East, the narrow outlook gained through the study of science, the final manifestation of a decadent civilisation as illustrated by Canada and the policies of Anthony Eden. The Hon. Visitors included Rabbi Maurice N. Eisendrath, representatives from the University of Melbourne and McGill University, Mr. J. D. Gibson (a graduate of University College, now an economist with the Bank of Nova Scotia) and Dr. H. B. Speakman. The attendance at the debates was not as large as it was hoped it would be, but those who came were very enthusiastic and showed much interest and on no occasion was the Speaker able to allow all those to speak who wished to do so.

Student Christian Movement

The most outstanding activity of the Movement in Hart House this year was the Wednesday noon-hour addresses in the music room on the general theme "Christianity Faces a New World". The addresses aroused considerable interest and were well attended. Among the speakers were Shoran Singha of India, Dr. W. C. Lockhart, Mr. Woo Da Ling of China, Dr. Stanley Russell, Professor T. W. Isherwood, the Rev. E. S. Lautenslager, the Rev. J. D. Parks, the Rev. W. L. Smith, the Venerable Archdeacon Fotheringham, the Rev. G. Cragg, the Very Rev. the Dean of Toronto, Dr. J. R. P. Sclater, Dr. Crossley Hunter, Professor G. Wilson Knight, Dr. G. Sisco, the Rev. E. J. McCorkell and Dr. Richard Roberts. In the Chapel, which is used by a number of undergraduates for private prayer and meditation, there was an early Sunday morning celebration of Holy Communion on the second Sunday of the month. Every Tuesday during term a short midday service lasting twenty minutes took place there and on Thursday at noon a group met in Wycliffe College for prayer. Archbishop Owen spoke at the Lenten services during March which the Rev. Philip Beattie conducted. There are signs that during the past year not a few undergraduates have reached a deeper realisation of the value of prayer and meditation. The Movement played an active part in promoting the National Conference of University Students which met at Winnipeg during the Christmas vacation. The Dean of Exeter Cathedral and Professor Reinhold Niebuhr of New York were among the main leaders. The Dean visited the University on his way to Winnipeg. Among other prominent leaders the S.C.M. brought to the University during the academic year were Mr. Max Yergan, Dr. John Mackay, the Rev. W. Paton, Dr. T. Z. Koo, Mr. E. K. Higdon, Mlle. Suzanne de Dietrich, Miss Rose Terlin and Dr. Sherwood Eddy. The S.C.M. further were largely responsible for the appeal in the University for the relief of Chinese students, $547.16 being raised from undergraduates and members of the faculty.

Theatre

This season, for the first time in the history of the theatre, there was no Director on the theatre staff. As a result no regular series of plays was presented nor was there a play entered in the Dominion Drama Festival. However, the entire technical and business staff was retained to keep the auditorium open for rental business. This was larger than in any previous year and twenty-three organisations not including university groups held productions in the theatre. For the second year in succession the University Drama Festival was held, the entries being more numerous and the entire festival more successful. The University College Dramatic Society once again won the award given by the President of the University. A series of lectures on the theatre was sponsored by the University Drama Committee. This was the first time that anything of this nature was attempted and proved to be very popular with the students. It is to be hoped that the years to come will find even more activities of a similar nature interesting the student body. This committee produced a play under the direction of Mr. Edgar Stone, the members of the cast being drawn from the various colleges and faculties in the University. The enthusiasm shown in this venture and the quality of the work would seem to guarantee its continuance. It is interesting to note that the following dramatic societies and faculties in the University made use of the theatre during the year: the University College Alumnae Association, L'Alliance Française, the Trinity College Dramatic Society, the University College French Club, the Victoria College Dramatic Society, the Medical Society, the Engineering Society, the University College Literary and Athletic Society, the Faculty of Dentistry Students' Parliament and the University Drama Committee.

VISITORS

Among the visitors to Hart House during the past twelve months were Miss Zoë Lavallin Puxley, Mr. Walter S. Allward, Mr. H. E. Wimperis, Miss Mary Trevelyan, Mr. R. B. Bennett (Rector of the Grammar School at Jedburgh, Scotland), Captain Griffiths Powell, Professor E. J. Dent, Professor K. H. Bailey, Dr. W. Bryden, Mr. Thomas Mann and Mr. F. Ashton-Gwatkin.

COMMITTEES AND STAFF

During the Warden's absence in the past year Hart House was especially fortunate in the President's appointment of Dr. H. Wasteneys as Chairman of the Board of Stewards. His long association with the House and its committees made Dr. Wasteneys the ideal choice as Chairman of the Governing Body of the House. The new House Committee which is an amalgamation of the former House and Hall Committees performed their duties in an excellent manner and there is no doubt that the joining of these two committees is amply justified. Through their wise counsel in this their second year the Glee Club Committee have fully merited their status as a Special Committee of the House. It is keenly regretted that three senior members of the committees have found it necessary to resign this year—Professor T. F. McIlwraith from the Chairmanship of the House Committee, Professor A. F. W. Plumptre as a faculty member of the Debates Committee and Mr. A. B. Ward from the Chairmanship of the Graduate Committee. To these and indeed to all senior members of the committees Hart House owes a deep debt of gratitude for their valuable assistance in its affairs year by year.

The Warden's absence necessitated the temporary appointment to the staff of Mr. J. R. Johnston, a former secretary of the House, whose wide knowledge of the House made his services invaluable. Hart House was fortunate also in being able to retain Mr. D. L. Emond as assistant secretary for another year. This spring Mr. J. A. Bartholomew, who has been superintendent of the dining hall department since 1932, resigned and has been succeeded by Miss Muriel Ransom, a graduate in Household Science in 1934.

The Acting Warden wishes to convey his sincere thanks to the President of the University and to the staff and the members of the committees of Hart House for their whole-hearted co-operation during the past year.

(22) REPORT OF THE DIRECTOR OF CONNAUGHT LABORATORIES

(J. G. FitzGerald, M.D., LL.D.)

This is the twenty-fourth annual report of the Director of Connaught Laboratories. It is a review of the work carried on during the year 1st July, 1937, to 30th June, 1938.

During a part of this time, in the absence of the Director his responsibilities devolved upon Professor R. D. Defries and Professor C. H. Best, and grateful appreciation is here extended to them for generously assuming additional burdens and duties.

It has been a year of further progress and development. It is a fine tribute to my colleagues and associates that, despite a slight reduction in the numbers of the scientific staff, research and investigation have been prosecuted on a more extensive scale than in any previous year.

The fundamental purposes for which the Laboratories exist, namely, extension of the boundaries of knowledge in the broad field of preventive medicine, co-operation with public health agencies throughout the Dominion of Canada, the production and distribution of biological products, and the support and encouragement of postgraduate teaching in public health, have always been kept in view.

Reference has already been made in earlier reports to the Connaught Laboratories Fellowships in Public Health, made available each year to a certain number of medical graduates in the various provinces. Perhaps no other aspect of the work of the Laboratories has been more generally commended or widely appreciated than this. As a result of co-operation with federal and provincial public health authorities, the Laboratories continue to occupy an important place in the public health organisation of this country. Further consolidation of the mutually helpful and profitable co-operation with the University of British Columbia has been maintained. The Western Division under the guidance of Dr. C. E. Dolman has been most active in the prosecution of research. A review in greater detail of the work of the various sections of the Laboratories appears later in this report.

Staff Changes

During the year Dr. Geoffrey Rake resigned his position to take up an appointment in the United States.

Dr. J. S. Kitching resigned from the staff in February to undertake new duties in the Metropolitan Health Board of Vancouver. During the three years in which Dr. Kitching was a member of the staff he made substantial contributions in his special field of work and discharged his routine duties in a most satisfactory fashion.

Dr. F. O. Wishart, for several years past a research fellow working with Dr. James Craigie, has resigned to assume the duties of lecturer in hygiene and preventive medicine in this University.

Dr. M. Doreen Smith, a research assistant in Professor Moloney's section since the autumn of 1931, is leaving this year. It is a pleasure to record the high opinion in which Dr. Smith is held as a hard-working and conscientious investigator, and her services to Connaught Laboratories are gratefully acknowledged.

Dr. R. J. Gibbons, research assistant in Western Division, resigned to enter the service of the Department of Pensions and National Health as a bacteriologist. Dr. Gibbons' services were warmly appreciated and are here acknowledged with gratitude.

Dr. K. K. Kay, first research assistant in industrial hygiene and more recently an assistant in the office of the Comptroller, has resigned to accept a fellowship in the Harvard School of Public Health.

During this period there have been many changes in the personnel of the Farm Section. These are set out hereunder.

John Fulton, resident engineer for seven and a half years, returned to Ireland in 1937. His position has been filled most satisfactorily by his first assistant, John Follansbee.

Gavin Martin, a most valuable technician, who had served in that capacity for six years, resigned in September 1937 to enter the course in mechanical engineering in the Faculty of Applied Science and Engineering in the University of Toronto.

Edward Perkins, another most reliable technician, after eight years' service resigned to enter upon other activities.

Thomas Perry and Richard Aldom, who had a much shorter association with this institution, returned to their university courses which were interrupted during the depression.

Dr. Donald Heard, who had charge of oestrin research, resigned and accepted a position on the staff of the department of biochemistry, Dalhousie University, Halifax.

Dr. Arthur Charles transferred from the University to the Farm Section in the laboratory vacated by Dr. Heard in September 1937, since when he has carried on his investigation in the production and purification of heparin.

The tragic death of Christopher Smith, one of the earliest members of the laboratory staff at the Farm, was deeply regretted by all who knew him. He had been employed for twenty-one years, and was accidentally killed while coming to work on the morning of 12th July, 1937.

Appointments

The appointment of Dr. Kenneth F. Brandon as a research assistant (part-time) in Western Division was made on 1st June. A former member of the staff of the School of Hygiene and for the past year a member of the staff of the Metropolitan Health Board of Vancouver, Dr. Brandon's appointment is a further step in the development of even closer relations with the University of British Columbia. In his new position he will also be a member of the staff of the University of British Columbia, and it is confidently believed that in addition he will find a useful field of service in epidemiology in the Metropolitan Health Board of Vancouver.

Section of Bacteriology and Immunology

In the section of bacteriology and immunology, under the general direction of Professor Donald Fraser, studies previously reported have been extended and new projects initiated. The study of the duration of antitoxic immunity in response to three doses of diphtheria toxoid in children has been in progress for a number of years. This research has been time-consuming and has entailed the co-ordination of efforts of Dr. Alan Young in the field as well as our own in the laboratory. It has been abundantly shown that for the purpose of this study the Schick test is inadequate, since the results so obtained are not quantitative and thus fail to reveal the changes in antitoxin level in the children subsequent to immunisation. In addition, the Schick test itself acts as an antigenic stimulus, which fact alone precludes its use when spontaneous changes in antitoxin levels are being followed. Our results obtained subsequent to publication in 1937 indicate that of 107 children, given three doses of diphtheria toxoid two years previously, virtually all have shown a drop in antitoxin level from that attained at three or six months after immunisation; nine had less than 1/100 unit; none however have completely lost their antitoxin. Of the total of 244 children whose blood has been titrated at any interval of time subsequent to immunisation, three only have shown no detectable antitoxin ($<1/500$ unit) following three doses of toxoid. It is anticipated that when the group of children tested at the four-year interval is completed, more will have lost their antitoxic immunity.

Dr. FitzGerald carried out a study to determine the effect of repeated Schick tests on persons with no demonstrable antitoxin ($<1/1000$ unit) in their blood serum. The Schick test, with an antitoxin titration previous to performing the test, has been done at four-week intervals. In all six Schick tests and seven titrations have been done on each person. There has been no evidence of antitoxic response. One additional individual, in contrast with the above group, with an initial titre of $>1/1000<1/500$ unit, showed an increase in antitoxin one month after the Schick test alone. The antitoxic response to this small antigenic stimulus was strikingly great, namely three-quarters of a unit.

With the co-operation of Dr. Beverley Hannah of the Riverdale Isolation Hospital, diphtheria antitoxin assays have been carried out on sera from persons admitted as diphtheria cases, carriers and suspected diphtheria. Cultures from those persons have also been examined, and correlated with the antitoxin titre of the serum. In some instances the results have been of assistance in arriving at the final diagnosis.

In co-operation with Dr. Grant Fleming, McGill University, Montreal, titrations have been done on the sera of children who have been immunised some years previously. Blood samples were obtained at the time of Schick testing.

Serum samples from 49 originally Schick positive children, drawn three months after the administration of alum precipitated toxoid, were titrated. The numbers in each group were small, but the results indicated that two doses of 0.5 cc. amounts were better than one dose of 0.5 cc. or of 1 cc. alum precipitated toxoid.

Dr. Ruth Dow, Alexandra Hospital, Montreal, has been co-operating by sending sera from patients diagnosed as diphtheria and from carriers. Titrations have been compared with the results of examination.

The diphtheria carrier survey of school children in Toronto has been continued in co-operation with the Department of Public Health, City of Toronto. Of approximately 1400 cultures taken in 1938 none were found to be virulent. Routine cultures have been isolated from cases and carriers from the Riverdale Isolation Hospital and from the Hospital for Sick Children. They have been tested for virulence and carbohydrate reactions and dried and added to the collection of diphtheria cultures.

Dr. Brown has carried out an investigation on the use of the Tuberculin Patch Test. In the preliminary trials it is evident that the test is specific. Thus of 382 persons positive to tuberculin as shown by the intracutaneous (Mantoux) test a reaction was not noted with the patch test in any person who failed to react to a Mantoux test. It appears that the patch test is as sensitive as 0.01 mg. of old tuberculin intracutaneously administered and only slightly less sensitive than 0.05 mg. Various modifications of the patch test are being tried in order to obtain data on the most suitable form of application. Dr. Brown is continuing his studies of the pneumococcus with particular reference to the production of rabbit serum for clinical use and the typing of strains. The study of seven groups of the typhoid bacillus as delimited by Dr. James Craigie with bacteriophage has recently been undertaken. The keeping qualities of typhoid vaccine under varying conditions is being followed. The typing of 500 strains of the tubercle bacillus isolated by Dr. A. L. MacNabb of the Department of Health, Ontario, has shown that the incidence of bovine tuberculosis in man is low in this province. The investigation and typing of salmonella strains isolated in Canada is being continued.

Dr. Frieda Fraser and Dr. D. L. MacLean have investigated the use of the tannic acid precipitate of scarlet fever toxin kindly furnished by Dr. M. V. Veldee of the National Institute of Health, Washington. The investigation of the virulence and immunity against different strains of haemolytic streptococci in certain laboratory animals is being continued. Dr. Helen Plummer has compared a strain of haemolytic streptococcus with the well-known N.Y. 5 strain to determine whether the former may advantageously be substituted for the latter in the routine production of antitoxin. Of 161 toxigenic strains of haemolytic streptococci, 87 per cent were distributed throughout 22 agglutinative types. Of approximately 500 strains of Group A haemolytic streptococci 93 per cent have been placed in one or other of 22 types by Griffith's slide agglutination test. It is suggested that this test is of practical use in epidemiological investigations. Dr. Plummer has been pursuing the investigation of certain of the anaerobes.

Dr. Ronald Hare, with the assistance of Dr. C. H. Yen of Peiping, has made a detailed study of three of the eight strains of influenza virus isolated in 1937 in Toronto. These three strains were the only ones which were successfully adapted to mice. Based upon preliminary investigation it would seem that, upon antigenic analysis, the Toronto strains are alike and closely resemble the New York strains whereas there is an apparent difference between the Toronto strains and those isolated in 1933 in London and in 1934 in Porto Rico. The response in complement fixing and virus neutralizing antibodies in human beings have been studied during an epidemic in cases and contacts. Active immunization of mice has been successful with both living and formalin killed cultures and studies are directed to determine the antigenic value of different strains, living and inactivated virus, and the best methods of inactivation and preservation

of the vaccines. Experimental infection in mice has been treated with convalescent serum from ferrets, also from other experimental animals and man whose sera possess a high titre in neutralizing the experimental infection in mice. In collaboration with Dr. Hurst Brown and Dr. Feasby of the Western Hospital 100 nurses are being kept under close clinical supervision and all cases of respiratory tract infection are being investigated clinically and bacteriologically in an attempt to establish methods of accurate diagnosis of these conditions.

During the year the investigation of meningococcus carrier rates in contact and non-contact groups of individuals has been continued by Dr. Silverthorne. The strains of meningococcus isolated from these groups have been studied in respect of their virulence and type distribution. All of the contact carrier strains have been shown to possess fairly high degrees of virulence for mice in contrast to the majority of non-contact carrier strains which are avirulent. The strains from both groups have been found to be largely Type II. Clinical studies of meningococcic meningitis have been pursued and the bactericidal properties of serum investigated.

The production of a dried bactericidal guinea-pig serum using freshly isolated meningeal strains of H. influenzae has been continued. This serum which is high in complement value, has been used with anti-influenzal horse serum in the treatment of cases of influenzal meningitis with a few gratifying results. Strains of H. influenzae isolated from the spinal fluid of cases of meningitis have been subjected to bacteriological investigation. The typing and virulence tests on these strains have revealed that they are a homologous series and that for the most part are virulent in mice.

The studies on whooping cough by Dr. Silverthorne have been extended. The use of duplicate cough plate cultures in the bacteriological diagnosis of the disease in its early stages has been found to be most reliable. Our studies on active immunization of children using a freshly isolated strain pertussis vaccine have shown that children may be successfully immunized, as compared with an unvaccinated group of controls. The results are promising and the trial is being continued and extended. During the past year a satisfactory lethal test has been developed by producing a fatal septicaemia with H. pertussis in a high percentage of mice. Pertussis vaccines used in the prevention and treatment of whooping cough have been tested for their protective value by inoculating previously vaccinated mice with freshly isolated strains of H. pertussis suspended in mucin. This test would seem to be of practical value in the laboratory control of the antigenicity of pertussis vaccines.

Dr. J. S. Kitching and Dr. Leone Farrell have contributed two papers (published in the Journal of Immunology) dealing with the stability, antigenicity of staphylococcus toxoid and with alum toxoid respectively. Other studies in this field dealt with the rate of absorption and excretion of staphylococcus antitoxin; changes in antitoxin following infection in animals and, in collaboration with Dr. Wm. Keith, Hospital for Sick Children, in children; staphylococcus antitoxin content of age groups; toxigenicity of strains of staphylococcus and an analysis of their toxins. Mr. R. J. Wilson has investigated a number of strains of staphylococcus from a food-poisoning outbreak. He was able to show the identity of cultures obtained from cases, from food handlers in a bakery and from the incriminated food.

Section of Chemistry in Relation to Hygiene

Under the direction of Dr. P. J. Moloney the routine production of diphtheria toxoid and Schick test toxin has been carried on as in previous years. Certain changes have been made in the procedure of assaying the toxoid for antigenicity and toxicity. This work has been concentrated in a period of the year in which experience has shown that there is the least likelihood of failure in satisfactorily completing the requisite tests of the product.

Investigations carried on by Professor Moloney and Mr. M. D. Orr have been concerned with the following:—

1. The stability of purified diphtheria toxoid.

Very interesting results have already been obtained in the study of the stability of purified diphtheria toxoid, but there would not seem to be at the present time sufficient evidence to warrant the adoption of a method to purify toxoid for general distribution.

2. Further studies of the use of amine precipitated toxoid.

Inconsistencies have been encountered in the antigenicity of amine precipitated toxoid but thus far the precise reasons for them have not been discovered.

3. The reactivity of various diphtheria prophylactics.

This study has been carried to the point where a publication of results seems desirable. A brief summary of the report indicates that "of all the diphtheria prophylactics only toxoid-antitoxin floccules and certain of our amine precipitated toxoids show a lowered reactivity, as judged by either skin reaction or anaphylaxis on guinea pigs highly sensitized to diphtheria toxoid. Moreover, it was shown clearly for toxoid-antitoxin floccules that the lowered reactivity was not due to purity of the toxoid associated with the floccules, but was more likely due to insolubility or slow dissociation of the floccules in the body fluids."

4. The purification of tetanus toxoid: its stability and the possible use of amine precipitated tetanus toxoid.

Dr. Edith M. Taylor has during the year investigated methods for the removal of iron in hog's stomach autolysate-maltose medium which is used for the production of diphtheria toxin. It would appear that iron occurs naturally in both the autolysate and the maltose. Dr. Taylor's results may be summarised as follows:—

1. Broth for diphtheria toxin production prepared from hogs' stomachs may be sterilised by autoclaving rather than by Seitz filtration without impairing toxin production. It is now apparent that failure to reduce the iron content of the autolysate to suitable concentration prior to autoclaving has been responsible heretofore for the difference in results obtained by the two methods of sterilisation.

2. In order to produce toxin of high potency, iron must be removed from the broth. This has been accomplished by treatment of the broth with infusorial earth.

3. Maltose suitable for diphtheria toxin production has been prepared by a simple and inexpensive method from corn starch.

Dr. M. Doreen Smith, in collaboration with Dr. Joseph Daly and Professor Moloney, has completed a study of the detoxifying action of human bile on diphtheria toxin. It was found that certain samples of human bile possess a heat-labile detoxifying activity similar to that of ox bile, and that the activity is not due to diphtheria antitoxin. Further it was shown that the heat-labile component of this detoxifying system may be replaced by the heat-labile component of ox bile, which alone is inactive. Dr. Smith has also succeeded in improving the method of separating the labile components of the detoxifying system and similarly has effected an improvement in the method of testing bile.

Section of Filterable Viruses, Epidemiology, and Biometrics

In the section of filterable viruses, epidemiology, and biometrics a series of interesting studies in virus diseases has been conducted under the direction of Professor R. D. Defries.

Dr. James Craigie and Dr. F. O. Wishart have continued their study of the serology and immunology of vaccine and smallpox viruses. The lability of the

immunising fraction of the complex antigen of vaccine virus has been further demonstrated by an examination of the ability of the virus or soluble antigens to combine with neutralising antibody. It has been confirmed that a gross and variable multiple of the amount of virus required to absorb specific agglutinins and precipitins is required to remove neutralising antibody from vaccine-immune serum. The amount of virus required to absorb a given quantity of neutralising antibody varies from 1,000 to 100,000th of the amount of virus neutralised by the same quantity of neutralising antibody. Further studies are in progress to elucidate this apparent paradox. The investigation has been facilitated by technical advances in the preparation of the large quantities of pure suspensions of vaccine virus necessary for absorption tests. It has been found possible to obtain yields of 10^{11} virus particles from a single rabbit under favourable circumstances. Further improvements in the application of *in vitro* serological tests to the study of vaccine virus have been effected as a result of the study of the influence of the concentration of various electrolytes and of pH on the agglutination and precipitin reactions. For example, the optimal concentration of NaCl for these reactions with vaccine virus has been found to be 1/10 to 1/20 that generally employed in serological reactions. Following a study of vaccinia-infected cells by dark-field observation, ultraviolet photography, and fluorescent microscopy, Dr. Craigie has evolved a staining method whereby the virus of the infected process can be studied in fixed tissue sections. This method permits a much more rapid and extensive examination of infected tissue than has hitherto been possible.

Dr. Craigie has carried out a special study of human blood samples obtained in the pre-paralytic stage of poliomyelitis. These samples were fractionated to exclude the possibility of the masking of circulating virus by neutralising antibody. The negative results obtained even after fractionation of the blood confirm the observations of others that the virus of poliomyelitis does not occur in the blood in any significant amount.

Dr. Craigie and Dr. C. H. Yen have continued their investigation of phages whose range of activity is limited to the V or virulent form of *B. typhosus*. They have made a special study of Type II typhoid phage which they had previously found to exhibit a high specificity for the type of strain of *B. typhosus* on which it was propagated. The reactions of some 500 strains of *B. typhosus* to various Type II phage preparations have been studied by special methods elaborated for this purpose. It has been found that by "phage typing" V form strains of *B. typhosus* can be classified into seven main groups and that the results thus obtained show remarkable correlation with epidemiological data. Although surpassing in sensitivity the usual fermentative and serological tests, and permitting a differentiation of strains of *B. typhosus* unobtainable by these methods, the phage-typing method yields results of absolute consistency. The types of *B. typhosus* thus determined appear to remain fixed on human or mouse transfer. The examination of strains obtained from England show that the same seven types occur in England as well as in various parts of Canada. The type of *B. typhosus* isolated from a case or carrier has been found to be identical with the type occurring in the individual whom he has infected. Outbreaks and epidemics due to each of the seven types of *B. typhosus* have been observed and all, with one exception, have been single-type epidemics. This exception was one in which two different types were recognised in samples of suspected water. The methods which have been elaborated in this study not only provide a new and useful tool for the epidemiological study of typhoid fever but also provide a basis for a serological re-investigation of *B. typhosus* and the possible development of improvements in the specific prophylaxis and treatment of this disease. Another aspect of this study deals with problems concerning the nature and behaviour of typhoid phages as problems in the virus field. Concerning the behaviour of Type II phage, the only satisfactory hypothesis which can be put forward to explain the observed phenomenon is that Type II phage exhibits a

regular "mutation" rate and that the various "mutants" of this type of phage are capable of attacking only one of the observed types of *B. typhosus*. The subjects of mutation and cell specificity of viruses are both significant problems in the field of virus research and the investigation is being continued in this direction.

Dr. Defries has continued his studies of rabies virus, confirming the observation that rabbits which have received rabies vaccine by intraperitoneal injection become highly resistant to rabies, even when the virus is inoculated intracerebrally. These studies have shown that a similar immunity can be developed if large doses of vaccine are administered intramuscularly. Practical use has been made of these observations in providing a method to determine the protective value of various preparations of rabies vaccine. It has permitted also the obtaining of definite information concerning the deterioration of vaccine when stored, the effect of temperatures, and the action of various chemicals.

In studying rabies virus, several methods of tissue culture have been studied and observations made of several strains of virus. Successful cultivation of the virus according to the method of Webster has been conducted and one strain has been carried through 28 culture-passages. The successful cultivation of the virus permits of study of its antigens and affords the possibility of an improved type of rabies vaccine. For the past two years rabies vaccine for veterinary use has been supplied to the Government of Trinidad for use in controlling a serious outbreak of rabies among cattle. The supplying of the vaccine has permitted the obtaining of interesting data and the study of a strain of virus from Trinidad.

The occurrence of a severe outbreak of poliomyelitis in certain sections of Ontario, including Toronto, afforded the department the opportunity to conduct several studies. Data were obtained by Dr. J. S. Kitching concerning 500 children, examined at the clinics and not considered to be suffering from poliomyelitis. Subsequent inquiry concerning 335 of these children showed that in only two instances had paralytic symptoms developed. Reference has also been made to the study of Dr. Craigie of blood samples from suspected and known cases of poliomyelitis. An investigation of cerebrospinal fluid from early cases was made by Dr. N. E. McKinnon, with negative findings. The virus of lymphocytic choriomeningitis, also, was not found.

Through funds made available by the Department of Health, Ontario, a field study was conducted to determine the possible value of a prophylactic nasal spray, consisting of one per cent zinc sulphate, one per cent pontocaine, and one-half per cent sodium chloride. The observations were made possible through the co-operation of the Hospital for Sick Children and the Department of Public Health of the City of Toronto. A total of 4,713 children received two sprayings, an interval of ten days elapsing between the sprayings. A statistical analysis of the results, with the study of a suitable control group, indicated that the nasal spraying, as conducted, had no protective value and further that it could not be considered a practical public health procedure.

Dr. Mary Ross made a detailed analysis of the data concerning a survey of Schick testing conducted in Toronto by Dr. Alan Young and Dr. D. T. Fraser, involving the study of 7,668 Schick tests. A similar analysis was made by Dr. Ross for Dr. Grant Fleming and Dr. B. Benjamin, of Montreal, concerning a group of 1,536 Schick tests. The Department has continued to collaborate with the Department of Public Health of Toronto in the analysis of data concerning children receiving diphtheria toxoid in Toronto. A study was made of the records for the years 1935-6-7, as relating to 40,000 children who received three doses of toxoid. Records are now available concerning more than 150,000 children who have received diphtheria toxoid in Toronto, thus making possible observations of great value in the determination of the effectiveness of diphtheria toxoid in the prevention of diphtheria. Of this number, 119,443 received three doses. Dr. McKinnon has continued his investigation with Dr. Ross of the

trends of the mortality from heart disease and cancer. Through the co-operation of a group of representative hospitals, Dr. A. H. Sellers has obtained records of foetal deaths in which autopsies had been made. As a result of this study, recommendations of a suitable classification of the causes of stillbirths have been published. Dr. Defries and Dr. Sellers have prepared a revision of the classification of the causes of morbidity for use in Canada. This work was undertaken in collaboration with the Department of Pensions and National Health, and the Dominion Bureau of Statistics.

Section relating to Hormones, Vitamins, and other Physiological Substances (under the direction of Professor C. H. Best)

The effect of heparin on thrombosis of the coronary arteries produced in dogs by the injection of sodium ricinoleate into the lumen of the vessel has been studied by Dr. Best and Dr. Solandt. In the animals which did not receive heparin, thrombosis of the main artery or its branches was consistently observed. In the heparinised animals the incidence of thrombus formation was greatly reduced. Dr. D. L. MacLean carried out the extensive histological studies which formed an important part of this investigation. Mr. L. Jaques in co-operation with Dr. Best has extended the researches on the methods of administration of heparin. Dr. William Thalhimer of New York and Dr. Solandt and Dr. Best have studied the effect of the so-called "exchange transfusions" on the nitrogen retention of nephrectomised dogs. Using a special pump with which 16 litres of blood per hour may be exchanged in each direction between the normal and nephrectomised animals, it has been found that the excess urea may be rapidly excreted by the kidneys of the normal animal.

One phase of the work utilising deuterium-containing fats has been completed by Dr. H. M. Barrett, Miss Ridout and Dr. Best. The sources of the excess fat accumulating in the liver under many different conditions have been determined. Miss Ridout and Dr. Best have continued their work on choline and liver fat. Papers on "Undernutrition and Liver Fat" and "The Relative Potency of Various Factors Affecting Deposition of Fat in the Liver" are in press.

During the past year much of Dr. Scott and Dr. Fisher's time has been spent on new arrangements for the extraction, purification and testing of insulin. Recently the Connaught Laboratories have made regular use of frozen as well as fresh pancreas for the extraction of the hormone. Investigations on the various stages of the purification of this hormone have been continued and these have resulted in the development of a process which is more economical in time and materials than that formerly employed. As a result of the year's work four papers are now ready for publication, namely, "Studies on the Pancreas and Liver of Normal and Zinc-Fed Cats", "The Ash Content of Nickel-Insulin Crystals", "The Insulin and the Zinc Content of Normal and Diabetic Pancreas" and "The Preparation of Insulin". Steps have been taken to prepare a quantity of zinc-insulin crystals and make a solution of these available for general clinical trial.

A new process for the preparation of a purified, concentrated solution for intramuscular injection has been developed by Dr. E. W. McHenry. The procedure eliminates 90 per cent of the impurities present in extracts prepared by former procedures and gives a solution effective in small dosage. Clinical testing has been made possible by the very helpful co-operation of members of the staffs of the Toronto General and Western Hospitals. During the development of the new procedure a study has been made of the properties of the anti-anaemic factor. Mr. D. W. Overend has determined the free amino-acids present in an active liver fraction. Sufficient information is now available to characterise the factor as a proteose.

Dr. G. A. McVicar has examined several tissues for the possible presence of the cortical hormone and has found it to be absent from foetal adrenal tissue, adult kidneys and ovaries. He is continuing an investigation of the rôle of histamine in adrenal insufficiency.

In connection with a study of food consumption by low-income families, Dr. McHenry and several members of his laboratory are co-operating with the committee in charge of the survey. Miss Gavin and Miss Barber have been responsible for the laborious calculations of food values.

Dr. McHenry and Miss Gavin began last fall an investigation of the relation of several of the B-vitamins to fat metabolism. They have secured evidence in rats and in pigeons that vitamin B_1 causes fat synthesis from carbohydrate. This vitamin, riboflavin, and vitamin B_6 have complementary effects upon body weight in young rats; the increase in weight is partially due to an increase in body fat presumably synthesised from carbohydrate.

Mr. E. J. Reedman continued his study of vitamin C under Dr. McHenry's direction until January 1 when he left to accept a position in the United States. He has secured evidence of the existence of a protein-ascorbic acid complex in certain tissues. Repetition of the work of Szent-Györgyi on vitamin P gave inconclusive results although there is some evidence that such a factor exists. In paired feeding experiments Mr. Reedman found that ascorbic acid caused the weight of guinea-pigs to be greater than in the control, deficient group. Since Mr. Reedman's departure, the work on vitamin C has been continued by Miss Margaret Sheppard. She has amply confirmed the effect of ascorbic acid in paired feeding experiments and, in collaboration with Dr. Fidlar of the Department of Physiology, has shown that the difference in weight is due to alterations in metabolism. The oxygen consumption of C-deficient guinea-pigs is markedly greater than that of animals receiving the vitamin with the same amount of food. Using the paired feeding technique, Miss Sheppard and Dr. McHenry are studying various effects previously attributed to vitamin C deficiency to determine whether these are caused by vitamin deficiency or by inanition. Indebtedness is gratefully expressed to the Banting Research Foundation for generous grants to Mr. Reedman and Miss Sheppard.

Mr. Philip Bouthillier of the University of Montreal was a guest in the department from April 4 to May 19. In collaboration with Dr. McHenry and Miss Sheppard he studied the estimation of ascorbic acid in urine.

Dr. McHenry's expert collaboration with members of the Scientific Advisory Committee on Nutrition in the construction of a Canadian dietary standard and a report on methods for dietary surveys has been of great assistance in these projects.

The results of an investigation of the radiation factor in the heating of Canadian homes has been published by Dr. Partridge and Dr. MacLean. In this study information regarding all the factors—temperature, air movement, humidity, and radiation—was obtained from dwellings in Toronto and in the rural area. The findings were expressed in terms of effective temperature, equivalent temperature and equivalent warmth. The data for Canadian homes were compared with the values for comfort in English dwellings. The amount of heat loss of a subject by radiation and convection under the ventilation conditions which apply in Canadian houses has been calculated.

Dr. Patridge has continued to use the high gain amplifier to study the function of the various fibres of the vagus nerve and has shown that cardiac depressor fibres may be identified in certain pulmonary branches of the vagus and that these fibres may act to hasten breathing. Dr. Partridge has another series of experiments in progress which are designed to study the effect on cats of a diet deficient in vitamin B_1. The study has particular reference to the cardiac changes and the effect of this diet on the nerves of the heart. Amplified records are being made to show the effect of vitamin B_1 deficiency on nerve impulses which have been discovered in a pressor branch of the vagus arising in the right auricle.

In the section of industrial hygiene, Dr. Barrett, in collaboration with Dr. MacLean and Dr. McHenry, secured data which confirmed Forbes, Neale

and Scherer's observations of the protective action of xanthine in carbon tetrachloride poisoning.

Dr. Barrett and Mr. J. H. Johnston have continued the work on the fate of trichlorethylene in the body. It has been shown definitely that trichlorethylene conjugates in the body in such a way that the steam distillate of urine from animals that have been exposed to trichlorethylene vapour contains chloroform. Some progress has been made in isolating the conjugated material.

A new reaction for the identification of carbon tetrachloride has been discovered. The reaction is being used in developing a method for the quantitative determination of carbon tetrachloride in air.

Farm Section (under the direction of Dr. N. E. McKinnon)

As in previous years the Farm Section has been responsible for the production of various biological products, namely, diphtheria, tetanus, scarlet fever, perfringens and staphylococcus antitoxins, anti-meningococcus and anti-pneumococcus sera, diphtheria toxoid, smallpox vaccine and rabies vaccine. In addition certain experimental sera, including anti-dysentery, anti-B. influenzae and anti-influenza virus, have been prepared.

Distinct improvements in the production of anti-pneumococcus serum have been effected. During the past year very considerable quantities of rabbit anti-pneumococcus sera (types I, II, V, VII, VIII) have been prepared. Therapeutic trials of certain of these sera have been made under the direction of Professor Duncan Graham at the Toronto General Hospital, and in certain other medical clinics. The results thus far obtained suggest that rabbit anti-pneumococcus serum as presently prepared can be given to patients without producing any immediate reaction.

The flocculation test is now used for the preliminary testing of the titre of scarlet fever antitoxin with satisfactory results. The large-scale production of rabies vaccine has been continued. The preparation of heparin is now being carried on under the direction of Dr. Arthur Charles. Greatly improved yields of the material are now being obtained. There is at present great interest in the use of heparin clinically. The recovery of volatile solvents has been carried on, on an even greater scale than in previous years, in the special laboratory constructed for the purpose.

The guinea-pig, rat, mouse and ferret colonies have been maintained most satisfactorily. A very marked increase in the size of the guinea-pig, rat and mouse shipments has been recorded for the present year.

Investigation of various problems closely related to production has been undertaken in the past year.

Dr. Cameron has overcome some of the difficulties encountered in his earlier attempts to repeat Rane's work on the flocculation of scarlet fever toxin and antitoxin; this procedure is now used to titrate "trial bleeds" and toxin.

Dr. Siebenmann has continued his study of the discolouration of silver foil in the cultures of certain bacteria. He has given considerable attention to investigation of meningococci, their virulence, the lethal potentialities of culture filtrates and their anti-genicity, the titration of anti-meningococcus serum, and the extraction of specific fractions of meningococci. His observations so far show that the filtrate from prolonged culture of meningococci in liquid medium is highly toxic and lethal for animals, including horses, when administered cisternally or intravenously, that it serves as an efficient antigen for the bacterial antibody but that it does not elicit any antibody which will protect against itself. This work is being carried further. Dr. Siebenmann has made a full chemical investigation of the new well water, its iron content and removal, its aggressiveness, etc., and has now undertaken a more complete chemical investigation of the problems associated with diphtheria toxin production.

Dr. French has studied certain aspects of the nature of antitoxin and toxin-antitoxin union. His observations fail to substantiate the suggestion that

refinement of antitoxin by peptic digestion yields antitoxin in purer state or in a smaller molecule than that achieved by other forms of purification. He has studied the fractionation and concentration of the pneumococcus protective antibody in both horse and rabbit immune serum. The complete solubility of the rabbit pneumococcus antibody in distilled water or in low salt concentrations is in marked contrast to the complete insolubility of the horse pneumococcus antibody. This offers the possibility of obtaining very high potency material, in other words a large dose in very small volume, from rabbit serum; an investigation of this possibility is under way. The results of various methods of concentration will be published in the near future. They show that a combination of sodium chloride and ammonium sulphate is superior to other agents.

The Library

Connaught Laboratories library, which each year is being added to, is accessible not only to members of the staff of the Laboratories but also to graduate and undergraduate students in the School of Hygiene, Faculty of Medicine, School of Nursing and other faculties and departments. Each year Miss Olga Somerville, the Librarian, has recorded an increased attendance of those desirous of availing themselves of the facilities of the library. The files of bound periodicals now numbering 2,425, and the collection of reprints and pamphlets, are particularly valuable for research workers and others interested in the original publications of many of the classical contributions in the fields of bacteriology, immunology, public health, vital statistics, physiology, biochemistry and epidemiology.

During the past year the library fortunately came into possession of a number of especially valuable reprints of early articles by Robert Koch. For these the Laboratories are indebted to the "Robert Koch Institute for Infectious Diseases" in Berlin. As in previous years the library is under obligation to the Canadian Public Health Journal for a number of current periodicals received in exchange by the Journal. Volume IX of the Studies from Connaught Laboratories appeared in February. It consisted of no less than fifty reprints of articles published during the year by members of the staff of the Laboratories.

The translation service carried on by Miss Pichler has been of great assistance to many members of the staff. The collection of translations has been catalogued according to the subjects for reprints, and many translations of earlier and much used papers have been revised and retyped. The bi-weekly indexes have been continued and are most helpful. Current periodicals are sent to the Farm section for the use of the staff, they remain there a brief period and are then replaced by the current numbers of the journals. In this way the library serves as a valuable unifying influence between the University and Farm sections of the Laboratories.

The products made available by the Laboratories were:—diphtheria antitoxin, tetanus antitoxin, perfringens antitoxin, scarlet fever antitoxin, staphylococcus antitoxin, anti-meningococcus serum, anti-pneumococcus sera, antianthrax serum, diphtheria toxoid, staphylococcus toxoid, Schick-testing preparations, scarlet fever toxins, typhoid vaccines, pertussis vaccines, vaccine virus, rabies vaccines, old tuberculin, pneumococcus typing-sera, preparations of heparin, liver extracts, Insulin, Protamine Zinc Insulin, adrenal cortical extract, pituitary extract (posterior lobe), and epinephrine hydrochloride solutions.

Connaught Laboratories have been happy to receive, during the year, visitors from the following countries:—Canada (Alberta, British Columbia, Manitoba, Nova Scotia, Ontario, Quebec and Saskatchewan); U.S.A. (California, Idaho, Illinois, Massachusetts, Missouri, New Jersey, New York and Tennessee); Belgium; Ceylon; China; England; France; India; Hungary; Jamaica; Japan; Korea; Panama; Roumania; Scotland; South Africa; Sweden; Yugoslavia.

Western Division (under the direction of Dr. C. E. Dolman)

On October 1st, 1938, the Western Division of Connaught Laboratories will have completed three years of operation, with quarters borrowed from the department of bacteriology and preventive medicine in the Science Building of the University of British Columbia. In this period it has created for itself a position of unique importance in the life of the University, of the medical profession, and of the public health services, of the Province. This position has been attained through rigid adherence to the pursuit of useful but disinterested researches in bacteriology, immunology, and epidemiology; through consultative advice freely given to practising physicians and surgeons, to the honorary medical staffs of hospitals, and to public health organisations; and through the prestige which undoubtedly accrues to the Western Division from its close affiliation with the University, and with the Provincial Board of Health, of British Columbia.

Staff.—The staff numbered five, as in previous years. Dr. C. E. Dolman, as research member of Connaught Laboratories, continued to give one-third of his time to supervising, and taking part in, the work of Western Division. In December, 1937, Dr. R. J. Gibbons accepted an appointment as chief bacteriologist to the Laboratory of Hygiene, Department of Pensions and National Health, Ottawa, and commenced his new duties on January 1st, 1938. This loss of so loyal and industrious a colleague was tempered by the satisfaction of knowing that his appointment to this important post was in no way hindered by the period of over two years spent as research assistant in the Western Division. In place of Dr. Gibbons, Dr. K. F. Brandon was appointed, commencing June 1st, 1938, as research assistant in Connaught Laboratories, attached to Western Division. Dr. Brandon will devote two-thirds of his time to research in bacteriology, immunology, and epidemiology, under Western Division auspices. For the remaining one-third of his time, Dr. Brandon will carry certain administrative duties as Epidemiologist to the Greater Vancouver Health Committee, and will also act as Director of the University of British Columbia Health Service.

The laboratory technicians, J. Polglase and V. Bjarnason, continued to give invaluable assistance throughout the year; while the other technician, M. McClellan, who left in May to join the Royal Canadian Air Force, after two years of most satisfactory service with us, has lately been replaced by F. Jefferies.

Research Work.—Dr. Dolman has now completed the seventh year of research, under Connaught Laboratories' auspices, into the complex pathogenic and antigenic properties of staphylococcus toxins. During the year under review, the kitten test for staphylococcus enterotoxin, first developed in Western Division, appears to have achieved general recognition as the best available method for detecting this substance. In collaboration with Mr. R. J. Wilson, who held tenure until September 30th, 1937, of a much-appreciated grant from the Banting Research Foundation, Dr. Dolman published the results of further work on the enterotoxin. Evidence bearing on the specific antigenic nature of the enterotoxin was presented, based upon animal experiments, and also upon flocculation reactions in which absorbed reagents were used.

Considerable work has been done upon the mechanism underlying the hot-cold lysis of sheep cells by certain staphylococcus filtrates, a phenomenon which has been attributed to the β toxin of staphylococci. Some highly interesting observations have been made regarding the action upon both rabbit and sheep red cell suspensions of staphylococcal filtrates containing a mixture of the α and β toxins. The important fact appears to have emerged that sheep erythrocytes which have been acted upon by the β toxin are rendered to some extent resistant to the action of α toxin, and vice versa. The bearing of these findings upon the haemolytic effects which develop around certain strains of staphylococci growing on blood agar plates has been investigated. The results of this work on the

haemolysins, as well as of the work on the enterotoxin, were presented in preliminary form at the Christmas meeting of the Laboratory Section of the Canadian Public Health Association in Toronto. Arising out of these presentations, requests have been received from centres all over the world for strains of staphylococci having characteristics therein described.

Staphylococcus antitoxin and toxoid continue to be used in the Province with marked success under appropriate circumstances. The close contact and happy relations which Dr. Dolman has been able to maintain with doctors in charge of cases of severe staphylococcal infection at both the large hospitals has led to some remarkable recoveries from staphylococcal blood stream infection, which it is hoped may later be published in collaboration with the doctors concerned. Dr. J. R. Naden in particular, of the Vancouver General Hospital visiting staff, has demonstrated a keen appreciation of the principles involved in staphylococcus antitoxin therapy. In three or four instances, over a million units of staphylococcus antitoxin have been administered by the intramuscular route. In one recent case, a young girl desperately ill with a septicaemia received about four million units of staphylococcus antitoxin, and eventually made a recovery which could not possibly have been anticipated in the absence of serum therapy. Dr. Naden has gallantly supported the cost of such treatment entailed to the hospital concerned, by the irrefutable argument that the value of a human life saved cannot be measured in terms of dollars spent upon a specific biological product.

In addition to the work on staphylococcus, Dr. Dolman has been very much concerned during the past year with the problem of *Brucella abortus* infection. In collaboration with the staff of the Provincial Board of Health Laboratories, and with graduate students of the department of bacteriology and preventive medicine, important facts bearing upon the Brucellosis situation in and around Vancouver have been discovered. These findings were also presented, in collaboration with Miss V. Hudson, at the Laboratory Section meeting of the Canadian Public Health Association, and have since been published in the "Journal". These findings have lent great weight to the campaign which we have continued to press for the compulsory pasteurisation of all milk sold in Vancouver.

Prior to his resignation from the staff of Connaught Laboratories, Dr. Gibbons completed a valuable trial of the relative merits of the old microscopic smear method and of the new cultural method of determining residual or doubtful gonococcal infection. His findings, which were presented at the Annual Meeting of the Canadian Public Health Association in Ottawa in June, 1937, were published in the "Journal" during the year under review. As a result of his work, the Provincial Board of Health Laboratories decided to make facilities available to the Division of Venereal Disease Control of the Provincial Board of Health for gonococcus culture in suitably selected cases. The technique has proved a most valuable addition to public health diagnostic laboratory methods. This fittingly illustrates what has been pointed out in previous reports—the practical advantages of coordinated activities in the broad field of preventive medicine to all the participating organisations.

Since commencing duties in Western Division, Dr. Brandon has started promising researches into two main fields; first, the epidemiology and bacteriology of typhoid fever, with special reference to the applicability of Dr. Craigie's method of grouping by use of specific Vi phages; and secondly, the epidemiology, bacteriology, and immunology of scarlet fever. This latter disease is always present in Vancouver. The specific biological agents available for its treatment and prophylaxis have not been properly and adequately used by local physicians and institutions, and there are many controversial points in the field of public health administration which have arisen around the problem of the control of scarlet fever. It is believed that useful results, both direct and indirect, would accrue from Dr. Brandon's researches in this field. His position as City Epi-

demiologist will, of course, facilitate his tracing of the clinical aspects of the problem which he pursues to conclusion in the laboratory, while the Provincial Laboratories will prove a valuable source of strains of typhoid bacilli and of haemolytic streptococci for his investigations.

In conclusion, it may be pointed out that the Western Division, as it exists at present, is still gravely handicapped through lack of accommodation, while any possibility of future expansion of its activities must be contingent upon more space becoming available. The prestige which Connaught Laboratories holds in the eyes of the University of British Columbia authorities, of public health officials, and of the medical profession in this Province, was never higher, and has unquestionably been enhanced since the establishment of the Western Division. If the opinion of any representative of the foregoing groups were asked, there could be no doubt of their emphatic endorsement of the establishment of the Western Division, and of their desire that it should prosper and expand.

The Director is indebted to the members of the Connaught Laboratories Committee of the Board of Governors for continued support throughout the year; and to his colleagues and to the members of the staff of the Laboratories generally, he is greatly indebted for their collaboration and assistance.

(23) STATEMENT REGARDING THE MUSEUM OF ARCHAEOLOGY

(Professor C. T. Currelly)

During the year 1937-38, the steady growth of the Museum collections continued.

Ninety-one donors presented a large number of objects. Many of these were of very considerable artistic and monetary value; others, while lacking intrinsic value, had distinct importance in relation to objects already in the Museum collections.

Perhaps the most outstanding acquisitions were in the field of European sculpture. Following the 13th century Spanish Madonna and Child reported last year, we obtained three other extremely important pieces, one 12th century Spanish, one 13th to 14th century French, the third 16th century French. One of the interesting Nottingham alabaster carvings of the 14th century, a "Coronation of the Virgin", was also received. Another addition of the highest importance was a carved oak reredos, Flemish work of the 16th century. A masterly piece of carving, it embodies all the chief features of late Gothic art, and is therefore a marvellous teaching piece.

The Egypt Exploration Society as usual sent us some of its finds of the previous season's excavations, in recognition of Sir Robert Mond's contribution to its work; these consisted of thirty-nine objects from Sesebi, Nubia. University College, London, also presented over a hundred Egyptian weights, through the kindness of Professor S. R. K. Glanville.

A few pieces of metalwork were obtained, the best of which were a French-Canadian silver chalice of the early 19th century, a Sheffield plate dish-ring, and three pieces of pewter. A church desk of fine design and workmanship and a comb-back Windsor chair were added to the French-Canadian room.

In the department of European ceramics, especially interesting accessions were a beautiful 17th century pottery plate made at Nevers and an early Sevres soft-paste cup and saucer. A dozen pieces of English porcelain included Worcester, Spode, Rockingham and Swansea wares.

Great good fortune attended the glass collection. During the preceding year we had been offered a rare opportunity to acquire a large collection of the finest Irish and English glass of the 18th and 19th centuries. When this collection, nearly three hundred pieces, was put on view, Mrs. R. Y. Eaton very

generously paid for it. Through the gift of Lieut. Col. S. R. Heakes, nine more pieces of English and Irish glass of equally high quality were received.

Gifts to the textile department included several 19th and early 20th century dresses and hats, a lace-trimmed linen nightgown and pair of silk stockings worn by Queen Victoria, four pieces of lace, a late 18th century cope of French brocade, and two important Stuart needlework pictures in petit point and other stitches, presented through the kindness of Mrs. H. J. Cody.

One of the most exciting events of the year was our acquisition of a Japanese sutra printed about the year 770. By order of the Empress, a million of these charms were printed, encased in a million tiny wooden pagodas, and presented to a number of the temples. They are the earliest piece of printing known, and though numbers of them survive in Japanese temples, only half-a-dozen are in the possession of European and American museums. Other additions in the department of printing and the book were a work on anatomy from the press of Christopher Plantin, 1566, bound in beautifully tooled leather in 1567, a gift from the late Mr. T. D. M. Burnside; an illuminated manuscript on parchment; a leaf from a French 14th century antiphonary, with a beautifully illuminated miniature painting of the Resurrection; thirteen prints by contemporary Canadian and American artists; the copper-plate for the mezzotint portrait of General James Wolfe by R. Houston after Hervey Smith, the gift of Sir Robert Mond. The Post Office Department continued to deposit in the Museum a specimen of each new issue of Canadian postage stamps; and a large number of stamps was received through the enthusiasm and energy of Mr. Paul Hahn.

An early bronze libation cup, a "Temmoku" pottery jar, a small iron-rust porcelain vase, and a number of lithographs were the only additions to the Chinese collection. Outstanding in the Japanese department was the acquisition of sixty drawings by Hokusai. Other additions of special interest were twenty-two handsome brocades of the 18th and 19th centuries, seven silver vessels, and seventeen pottery tea bowls and jars.

The Near Eastern collections were augmented by two 13th century Persian pottery bowls and three fine Persian miniatures. An interesting Indian miniature was also obtained; and a valued gift was a small plaster head from Afghanistan, illustrating the Graeco-Buddhist sculpture of the 2nd century.

In the ethnological department, a few pieces were acquired by purchase and a large number through the usual steady stream of gifts. The following stand out as specially important: an effigy stone pipe from Ontario; a red obsidian spearpoint from Saskatchewan; six masks and an exquisitely woven cedar basket from British Columbia; Eskimo material from King William Land and Victoria Land; a Nasca pot; a collection of Indo-Chinese material from Laos; a number of S'ora artifacts; and a collection of Central Australian material.

The work of the Museum carpenter shop was concentrated as much as possible on the making of mounts for the ethnological collections and the cabinets of pull-out drawers for the North American Indian Study Room, where many thousands of specimens have been arranged geographically. A good start was also made on the storage cupboards, for which the making of gallery cases and mounts had left no time since the reopening of the Museum.

Beside the regular cleaning and preservation of specimens, the preparator's department was able to carry out the special task of cleaning our hundred Paul Kane paintings, which seem to be used more each year in connection with the study of the Indians of Ontario and the West a century ago. A great deal of mounting was also carried out, mainly for the ethnological department.

Satisfactory progress was made in the printing of permanent labels, and in the accession catalogue and the pen-and-ink drawings for the scientific catalogues. Thanks to two new part-time appointments, we were able to give more help to Miss Home in the teaching of the constantly increasing number of groups of schoolchildren and adults who came to the Museum for instruction.

Publication of the Bulletin was resumed after a lapse of five years due to shortage of funds. No. 12 appeared in July, containing Dr. White's description of one of our great Chinese temple frescoes. The other two frescoes will be published in succeeding Bulletins.

Two exhibits of two cases each were arranged to take part in the Royal Ontario Museum's travelling loan exhibits. In the spring we again loaned a gallery for the annual exhibition of the Canadian Guild of Potters.

The two great highlights of the year were connected with the East Asiatic department. One was the opening of the Sigmund Samuel Gallery, housing the great Professor H. H. Mu Library of Chinese books. The other was the Rockefeller Foundation's presentation of a grant, to be paid over a five year period, for the development of teaching and research in Far Eastern subjects. Under the first year's grant, we have been singularly fortunate in securing the services of the Rev. J. M. Menzies, without a peer in his knowledge of early periods of Chinese archaeology.

A hope of many years has been realised in our start at scientific excavation. During the spring it became feasible to plan for two months' work on an Ontario Indian site; and at the beginning of July, a small group under the leadership of Dr. Nash will leave for Aylmer, where a promising site on the farm of Mr. John Pound has been kindly placed at our disposal. I trust that next year's report will announce finds of sufficient scientific interest to have made an auspicious start at what I hope may become a regular part of our year's work.

(24) STATEMENT REGARDING THE ROYAL ONTARIO MUSEUM OF ZOOLOGY

(Professor J. R. Dymond)

A new series of exhibits illustrating various biological principles constitute the most outstanding addition to our gallery during the year. The first three of these illustrate the role of the predator, pyramid of numbers and periodic fluctuations. The exhibit illustrating the economic value of Canada's fisheries has been reconstructed and made much more attractive. A series of enlarged models of small animals including house fly, grasshopper, spider and wood louse should prove of interest. Additions have also been made to the systematic collection of mammals, birds, reptiles, fish, etc.

Additions to the mammals mounted under the Reuben Wells Leonard bequest include grizzly bear, Stone's mountain (black) sheep and four outstanding specimens of the following breeds of dogs,—Saluki, beagle, and Kerry blue terrier.

During the year several temporary exhibits were arranged including work of Technical School art students done in the Museum, Australian shells, nature projects by children, wild-life photographs, aquarium show and tropical butterflies and moths.

The scientific collections show steady growth as a result of field work, donations and incidental purchases to fill gaps in material obtained by other means. The number of specimens of the more important groups added during the year were as follows:—mammals 1217, birds 2322, reptiles 100, amphibians 258, fish (lots) 1286, insects and spiders 11,530, molluscs and other invertebrates (lots) 4585.

Accessions to the library were 210 books and 3440 pamphlets. The library now contains 2204 books and 15,615 pamphlets.

Some of the more outstanding donations received during the year were:

Australian Museum, Sydney, Australia (through Miss H. Bain). Collection of 40 species of Australian shells.

Boggs, C. D., International Petroleum Company, Negritos, Peru. Collection of 234 bird skins and 4 sets of eggs from Peru.

Chant, Professor C. A., Richmond Hill, Ontario. Collection of 267 shells, representing 110 species collected in Australia and 1 shell rescued from the university fire of 1890.

Cook, Marshall A., Toronto, Ontario. Mounted sailfish.

Coventry, Professor A. F., Toronto, Ontario. Collection of 73 small mammals, 15 fish, 3 birds' nests and 2 snakes.

Hahn, Paul, Toronto, Ontario. Passenger Pigeon.

Kerr, Charles J., Hamilton, Ontario. 18 journals of his father and brother, John W. and Fred Kerr, Fisheries Inspectors of Hamilton, 1864-1898; 39 early reports of the Fisheries Department at Ottawa, 14 other government reports and 5 books.

Marsh, Rev. D. B., Eskimo Point, N.W.T. Skin, skull and antlers of a barren ground caribou, 9 fish, 10 birds and 115 insects.

MacGillivray, G. A., Toronto, Ontario. Diary of Chas. Fothergill.

McIlwraith, Estate of the late T. F., Hamilton, Ontario. 12 mounted birds including Passenger Pigeon, Mississippi Kite, and Eskimo Curlew.

National Parks Bureau, Ottawa, Ontario. One Grizzly Bear and skeleton.

Quentin, Rev. A. P., Toronto, Ontario. 130 skins of birds from West China.

Toronto Parks Department, Toronto, Ontario. 10 birds, 11 mammals, 9 reptiles, including 2 South American alligators, 2 gila monsters and black and green iguanas.

The Museum study of the fauna of Ontario is being continued through summer surveys in various parts of the province. Our area is in a particularly strategic position so far as certain zoogeographic problems are concerned.

The loan of material to other institutions for use in connection with their researches is increasing year by year. During the past year material has been loaned to the following: Carnegie Museum, Pittsburgh; Philadelphia Zoological Society; Philadelphia Academy of Natural Sciences; University of Minnesota; United States Bureau of Biological Survey; California Academy of Sciences; Dr. H. C. Oberholser.

The Museum is being called on more and more for the identification of material by a great variety of organisations and individuals. Following are some of those for whom material has been identified during the past year: Entomological Branch, Department of Agriculture, Ottawa; Fisheries Department, Ottawa; Dr. C. H. D. Clarke, National Parks Bureau, Ottawa; Dr. D. S. Rawson, University of Saskatchewan; R. A. McKenzies, Biological Board of Canada; Museum of Zoology, University of Michigan.

Through the cooperation of naturalists, sportsmen and other correspondents, the Museum is keeping an annual record of changes in the numbers of many kinds of animal. Such a record will be of increasing value in the future, in researches on animal population. During the past year 369 correspondents supplied such information. Of these 312 came from Ontario.

For the past two years various nature projects with children have been carried out at the Museum. Such projects are especially suited to the new Public School curriculum which emphasises activity on the part of the pupils. Exhibits of the results of these projects which have been held in our gallery have created much interest in this type of work and it is probable as a result that such natural history project work will find its way into the schools.

The number of persons seeking information is steadily increasing as is also the demand for the loan of lantern slides, and other forms of service offered by the Museum.

(25) STATEMENT REGARDING THE ROYAL ONTARIO MUSEUM OF GEOLOGY

(*Professor E. S. Moore*)

In addition to the regular work of the Museum, the staff participated in a number of public activities during the year. Three lectures were provided for the Tuesday afternoon series of lectures on Natural History: *The Origin and Decay of Mountains*, by the director, *The Romance of Silver*, by the assistant director, and *The History of the Porcupine Gold Camp*, by Professor G. B. Langford of the university staff. The Museum joined with the Museum of Mineralogy in providing an exhibit which has been displayed in some of the Ontario towns and cities. Several hundred young people, from various centres in the province, have been provided with instruction in geology in connection with excursions to Toronto.

The following additions have been made to the collections:

Donations: Mica from Pontiac country, Quebec, by Dr. E. W. Shaw.
Tourmaline from an Ontario locality, by Mr. John Jacob.
Striated boulders of unusual type from Ohio, by Mr. K. R. Taylor.
Ripple marked sandstone from the Don Valley, by Dr. V. J. Okulitch.

Exchanges: One hundred typical British rocks, from City of Liverpool Free Public Museums, Dr. D. A. Allan, Director.

Purchases: Ores, concretions, petrified wood, meteorite, ornamental stones, and other specimens from eleven states in the United States, and from Mexico, Brazil, Bolivia, England, Germany, Czechoslovakia, Roumania, Siberia, Australia, New Zealand and South Africa.
Books for the Museum library.

Collections: Collections of rocks and ores were made by the Director in western Ontario and Haliburton county, and a specimen of folded iron formation by the Assistant Director, in the Kenora district, Ontario.

A very interesting and instructive geological relief model, showing the Lake Iroquois shore line, the topography and the geology in the Toronto-Hamilton-Niagara area, was constructed in the Museum and placed on exhibit.

(26) STATEMENT REGARDING THE ROYAL ONTARIO MUSEUM OF MINERALOGY

(*Professor A. L. Parsons*)

It is with great regret that the retirement of Professor T. L. Walker as director of this museum is here recorded. His work from the founding of the Museum has been a work of love. During the academic year all his time that could be spared from his university work was devoted to the service of the Museum, and most of his summer holidays were given up to collecting abundantly from Canadian mineral localities. He was ever the first on hand and the last to leave and was a continual source of inspiration to his colleagues in their work.

His work in the past twenty-five years has augmented a good university collection of minerals and rocks, until the Museum has now not only one of the

finest gallery displays in America but also a collection which in point of completeness is excelled by few museums in the world. When the history of the Museum, which is now in contemplation, is written, the extent of his services can be better set out. As director *emeritus*, it is hoped that we may have the benefit of his judgment and advice for many years.

Dr. V. Ben Meen devoted the months of July and August to a collecting trip in Northern Ontario and Quebec, securing some striking exhibition specimens which have been put on display and a large quantity of material which is to be used in our exchanges with other institutions.

In addition, our collections have been further enriched by purchase, exchange and donations by friends. Further additions of fine specimens of gem stones have been made from the money provided by the bequest of the late Reuben Wells Leonard, Esq. Additional semi-precious stones from Canada have been added by donations from Dr. J. Satterly and J. C. Rogers, Esq., as well as by purchase from H. L. Richardson, Esq.

The collections have been enriched in new species by a continuing exchange with Harvard University. An exceptionally fine series of minerals from the cryolite deposit at Ivigtut, Greenland, has been received from the Philadelphia Commercial Museum following an expedition of the director, C. R. Toothaker, Esq. Our most extensive exchange has been with the New York State Museum from whom we received about two tons of calcite crystals from Sterlingbush, New York, to be used in the reconstruction of a calcite cave. The largest of these crystals weighs 476 pounds. At present most of the crystals have a white or grey coating which must be removed before the final reconstruction of the cave. After the removal of this coating the crystals are bluish purple in reflected light and a beautiful pink in transmitted light. It is expected that the installation of this exhibit may be completed in about a year.

At the request of the Department of Trade and Commerce, the Museum loaned a collection of Canadian semi-precious stones to be incorporated in the Canadian exhibit at the Paris Exposition. A similar lot was displayed in the Museum's exhibit at the Canadian National Exhibition. In collaboration with the Royal Ontario Museum of Geology a collection of minerals, rocks and ores was exhibited at Kitchener and Stratford as a part of the Museum's policy of encouraging loan exhibits in other parts of Ontario.

The automatic balopticon with its series of pictures relating to the mineral industry continues to be an attraction to young and old alike. The exhibit of fluorescent minerals is a never-failing attraction where thousands can see the different effect of ordinary light and ultra-violet light in producing colour in certain minerals. An ever increasing number of students are making use of the systematic collections of minerals and rocks and the paragenetic collections, with most gratifying results.

During the past year several special excursions of school children from other centres in Ontario have come to the museum on Saturdays. This involves extra work by members of the staff of the museum to give instruction to groups in the gallery. Arrangements are being made to continue this extremely important phase of the museum's work during the coming year, which may possibly involve the employment of assistants for the work.

The growth of the educational activities of the Museum as a whole has necessitated the giving up of a portion of our storage space so as to provide room for a children's museum and office quarters for the teaching staff. If the present policy of the Museum is to be continued it will be necessary in the near future to provide additional safe storage for duplicate material.

The routine work of the Museum has been well carried on by the two paid non-scientific assistants, and the part-time scientific assistant curator, Dr. V. Ben Meen, has completed an investigation of an unusual type of cancrinite from Bancroft, Ontario. By special leave he was able to take advantage of the gracious permission of the Assistant Secretary of the United States National

Museum to work under the direction of Dr. W. F. Foshag during the month of May and part of June, in improving his knowledge of museum technique and mineral analysis. In the best interests of the Museum it is desirable that this scientific work should be augmented by the assistance of a qualified man who should devote his entire time during the winter months to the service of the Museum.

(27) STATEMENT REGARDING THE ROYAL ONTARIO MUSEUM OF PALAEONTOLOGY

(*Madeleine A. Fritz*)

Considerable attention has been focused on this Museum during the past year owing to the installation in the galleries of invertebrate palaeontology of a magnificent series of mural paintings, the work of the eminent Canadian artist Mr. G. A. Reid. These murals, which are being provided from the funds of the Reuben Wells Leonard bequest, depict in a most striking manner the history of the world from its misty beginnings to the more or less well ordered world as we know it to-day.

Other outstanding exhibits placed in the galleries during the past year include:

(1) A Pleistocene mammal group from the asphaltic deposits near Los Angeles. This group consists of a sabre tooth tiger, two extinct wolves, and a giant sloth. It is accompanied by a painting which greatly aids the imagination in reconstructing a scene in California characteristic of the time when the skeletons, here displayed, were parts of living animals.

(2) The skull of a carnivorous dinosaur from the Cretaceous of Alberta.

(3) Two cases in which Jurassic and Cretaceous sea life may be seen diagrammatically illustrated by a series of life-like models.

(4) A case showing calcareous structures thought to be formed through the agency of algae that lived during various geological periods. Accompanying the specimens are photographs illustrating extensive limestone formations built up almost entirely of these structures, as well as a map of North America indicating their geographical distribution.

In connection with the Museum's general educational program, members of the palaeontological staff have taken care of twenty-one lectures and demonstrations to children from out of town schools, in addition to four Saturday morning lectures to groups of over four hundred Toronto children.

In the series of popular public lectures sponsored by the Committee of Directors the Museum of Palaeontology contributed two.

The following lists indicate the chief acquisitions to the Museum during the past year:

By exchange

Specimen of the extinct Dodo for an unprepared skull of dinosaur (*Anchiceratops*)—Dr. T. Barbour, Harvard University.

Collection of Australian sponges for a skull of fossil rhinoceras (*Coenopus*) and the skull of an oreodont (*Merycoidodon*)—R. Bedford, Esq., Kyancutta Museum, South Australia.

Collection of Permian brachiopods from India for a set of Ontario brachiopods—Dr. Charles Schuchert, Yale University, New Haven.

A series of Southern Methodist University publications for collection of publications by Dr. W. A. Parks and others—Dr. C. C. Albritton, Southern Methodist University, Dallas, Texas.

By donation

Two specimens of Devonian fish—Mr. R. G. Stewart, 54 Wychwood Park, Toronto.

Two coral specimens from Pembroke, Ontario—Dr. V. J. Okulitch, Royal Ontario Museum.

Algal structure—Mr. M. Frank, Jarvis Street, Toronto.

Fine specimen of trilobite, *Calymene niagarensis*—Mr. C. E. H. Dowler, 9 Prince Arthur Ave., Toronto.

Six blastoid specimens from Mt. Coleman, Alberta—Professor A. P. Coleman, Royal Ontario Museum, Toronto.

By purchase

Large collection of invertebrate fossils—Mr. J. E. Narraway, Ottawa, Ontario.

Large collection of calcareous algae—Dr. C. L. Fenton, West Liberty, Iowa.

By collection

Collection of Humber fossils—Fourth year students.

(28) STATEMENT REGARDING THE EDUCATIONAL WORK OF THE ROYAL ONTARIO MUSEUM

(*Helen Reynar, Secretary-Treasurer*)

Owing to the poliomyelitis epidemic last autumn the educational programme planned for the year was considerably upset. Notwithstanding the delay of six weeks in commencing school classes at the Museum, reports on the year's work show a decided increase in attendance over last year.

Out-of-town Groups

67 groups of school children (6,131 in all) visited the Museum from towns and cities outside of Toronto: Woodstock, Preston, Ridgeway, Elmira, Uxbridge, St. Catherines, Welland, Oshawa, Collingwood, Sudbury, Peterboro, among others. Included in this number were five large parties from Paris and Brantford, Trinity College School, Port Hope, London, Guelph, and Hastings County who enjoyed one of the popular "Museum Days" inaugurated last year. Assisting on these occasions were members of the Boy Scout Association who gave excellent service in conducting groups from one lecture to another.

Saturday morning lectures and movies

The Saturday morning illustrated lectures for children were carried on successfully, with a total attendance of 7,269. To prevent overcrowding, a plan was devised whereby the schools of the city were divided into three groups to come to the Museum on the first three Saturdays of the month, the fourth Saturday being reserved for separate and private schools of the city and for schools in the suburbs. Talks followed by moving pictures were given by members of the staff on the exhibits in the Museum: "Fishing in the Prehistoric Past"—movie: "The Lost World; This Changing World"—movie: "Volcanoes, Glaciers etc."; "Life in Egypt"—Movie: "Daily Life of the Egyptians"; "The Beaver"—Movie: "Grey Owl films".

Open Evenings

Six "Open Evenings" were held during the season, with an attendance of 998. The first Wednesday evening of the fall and winter months is reserved for clubs and societies who arrange in advance for special lectures in the galleries, one floor

being open each evening. Among the groups were the following: The Runnymede Dramatic Reading Club, University Chapter of Royal Arch Masonry, Workers Educational Association, Boy Scout Leaders, Ontario Hunters and Game Protectors Association, the Zonta and Soroptomist clubs.

Travelling Exhibits

Specially selected exhibits have been sent on loan to Kitchener and Stratford in rotation for display in the public libraries. In connection with a zoology exhibit, Mr. Lester L. Snyder lectured in both cities on "The Effects of Civilization on North American Bird Life"; Professor Ellis Thomson spoke on "Gems" and Dr. V. Ben Meen on "Minerals as a Hobby" the former at Kitchener, the latter at Stratford when the mineralogy exhibit was opened; in connection with the "Arms and Textiles" exhibit, Dr. Currelly lectured at Kitchener on "The Romance of your own Job", and in Stratford, with the Egyptian exhibit, on "Egyptian Tombs". At present there is a representative collection of Chinese objects in Kitchener. These loan exhibits are creating a great deal of interest and are attracting many visitors, as well as serving as excellent illustrative material for the schools.

Pay Courses

Following her usual practice, Miss Ruth M. Home arranged two pay lecture courses, one on "Pottery and Porcelain" with a registration of 62; the other on "The Modern House" with 35 in attendance.

In order to assist the teachers of Grade IV in new work required under the New Curriculum, a special course of 12 lectures was arranged for Thursday afternoons, with Professor T. F. McIlwraith and Miss Home in charge. 72 teachers availed themselves of this opportunity to gain information about "The African Negro", "Peoples of the Pacific", "The Eskimo", "Men of the Old and New Stone Age", "The Coming of Metal", "Communication", "Invention of Writing", etc.

Tuesday public lectures

For the fifth consecutive season the popular Tuesday afternoon lectures were continued under the auspices of the Committee of Directors, a series of seven archaeological lectures before Christmas, followed by ten on natural history subjects after Christmas. There was an attendance of approximately 3,500 at these lectures.

Miss Payne's public school classes

During the school year Miss Lilian J. Payne, teacher at the Museum under the Board of Education, lectured to 22,885 children in 601 classes. Four classes from the VII and VIII Grades visit the Museum daily. The pupils of other Grades are taken care of by Miss Home and Mr. F. A. Urquhart.

To meet the steadily increasing demands for lectures especially from the lower grades of the public schools and schools from out of town, the Board of Trustees appointed Miss Sylvia Hahn and Mrs. Stella Gould for part-time service during the busy months, and for the coming year Miss Ella Martin, M.A., Oxon. has been added to the staff as full-time assistant to Miss Home.

Steadily increasing use of the Museum is being made in connection with undergraduate university classes and by students in the School of Graduate Studies. This applies in particular to the students registered in Fine Arts.

The total attendance at the Museum during the year ending 30th June 1938 was 268,872.

(29) REPORT OF THE DIRECTOR OF THE DAVID DUNLAP OBSERVATORY

(*Professor R. K. Young*)

During the year 1937-38 the 74-inch telescope as constructed by the Sir Howard Grubb Parsons & Co. has continued to operate efficiently. At the time of its construction no facilities were available for coating the large mirror with the newly discovered aluminum or chromo-aluminum coating. Since the opening of the observatory we have used the chemical method of a silver deposit on glass. Apart from the labour involved in the latter process which has to be repeated two or three times per year the aluminum is a much superior reflector and lasts for several years. At least one company in the United States is now prepared to handle disks as large as 76 inches and we hope to be able to coat the mirror with aluminum in the not too distant future. If time is available a suitable apparatus of doing the secondary mirrors will be constructed in our own workshops.

As mentioned in the report of last year the need is felt of subsidiary pieces of apparatus. During the year we have put the 19-inch telescope into operation and made the upper end of the tube rotative. A self-recording microphotometer has been constructed in the workshops and the temperature control of the Hilger-spectrograph is being converted to the Wheatstone bridge method.

The number of clear working hours was about the same as last year, 1275 and during this time 1216 plates were secured. During the year there were 2730 visitors to the observatory.

Accessions to the library number 207 as follows: gifts 68, purchase 38, exchange 14, from R.A.S.C. 87. There are now 3296 volumes in the library of which 1702 are on loan from the Royal Astronomical Society of Canada.

On the afternoon of Tuesday, April 25th, four oak trees were planted in front of the observatory. The ceremony was informal. Trees were planted by Mrs. Jessie Donalda Dunlap, the donor of the observatory, Sir William Mulock, Mr. Moffat Dunlap and Professor Chant. This forms an auspicious start to the eventual reforestating of the large observatory grounds.

A bi-weekly seminar has been inagurated by members of the staff to facilitate covering recent astronomical literature.

(30) REPORT OF THE OFFICER COMMANDING THE U.O.T. C.O.T.C.

(*Lt.-Col. H. H. Madill, V.D.,*)

I have the honour to report on the activities of the University of Toronto Contingent of the Canadian Officers Training Corps for the academic year 1937-38 as follows:

The membership in the contingent, which showed a slight increase over the previous year, was distributed as follows:

Headquarters	7
"A" Coy (University College)	45
"B" Coy (Medicine & Dentistry)	75
"C" Coy (App. Science & Forestry)	94
"D" Coy (Arts other than U.C.)	70
Attached from other units for instruction	15
" " " " " duty	3
	309

Enlistment in the corps is voluntary and the primary object of the training is to prepare candidates for the War Office Examinations for Certificates "A" (lieutenant) and "B" (captain) in the various Arms of the Service. This training

is obtained with the least possible interference with a civil career and in case of a national emergency holders of these specialised qualifications may perform the service for which they are best suited and which would be of the greatest benefit to the country, while their liability for service is no greater than that of any other Canadian citizen.

The examinations consist of Part I, practical, and Part II, written, and cannot be taken before the second year of service. In 1937, seventy six per cent of the U. of T. candidates were successful in obtaining certificates. The 1938 results are not yet available, but 62 candidates took the Part II examinations and the following were successful in the practical examinations:

"A", Artillery	8	"A", Infantry	21
"B", Artillery	5	"B", Infantry	10
"A", Arty Survey	1	"B", Machine Gun	1
"A", Engineers	4	"A", Medical	6
"A", Signals	3	"B", Medical	1

Other qualifications obtained were,—

Signals—Visual Telegraphy	8	Line Telegraphy	12
Wireless "	2		

Canadian Small Arms School,—"A" Wing.....1.

The parades were held by companies twice a week of one hour duration and a battalion parade in uniform was held once a month at the University Avenue Armouries.

The course in rifle shooting was conducted for all ranks on the miniature range in Hart House and three prizes presented in each company and one to the best shot in the contingent.

The Contingent was honoured in having Sergeant G. H. Elms selected as a member of the Canadian Contingent which took part in the ceremonies in London at the Coronation of Their Majesties, King George VI and Queen Elizabeth on 12th May, 1937.

The Annual Inspection was held on Friday, 18th March, by Brigadier W. H. P. Elkins, C.B.E., D.S.O., and his staff who, after the ceremonial parade, inspected the members of the corps while conducting their work in the various arms. Brigadier Elkins presented the prizes for shooting and expressed himself as well pleased with the work which is being conducted.

(31 REPORT ON THE ACTIVITIES OF THE STUDENTS' ADMINISTRATIVE COUNCIL

(*E. A. Macdonald, B.A., Secretary-Treasurer*)

Provision was made in the University Act of 1906 for the Students' Administrative Council to act as the representative body of the students of the University of Toronto and to afford a recognised means of communication between the university authorities and the student body. Since that date the scope of its activities has greatly increased.

The Students' Administrative Council is composed of the presidents or the elected heads of every official undergraduate body, both men and women, of every college and faculty which go to make up the University of Toronto. It is, therefore, a thoroughly representative university organisation and is a powerful unifying force in the University. In addition, there are two members of the staff appointed by the President as his representatives on the Council, Professor S. N. F. Chant, and Professor J. R. Cockburn; there is also the president who must be a graduate of not more than five years standing, the general secretary-treasurer and the associate secretary.

The work of the Council is carried on by five important sub-committees, the Publications Committee, the Finance Committee, the Debates Committee,

the Sporting Activities Committee and the Loan Committee. The committees meet previous to each meeting of the Council and present their reports to the Council for their approval.

The publications of the Council include the *Students' Handbook*, which is given free of charge to every undergraduate on registration in the fall. This book contains much valuable information about the University having the names, addresses and telephone numbers of every officer of every undergraduate society and organisation of every faculty and college in the University. The advertising which the book contains covers the cost of the book and allows as well a small profit on the book. A hundred issues of the *Varsity* are published throughout the term, five days per week. Approximately 6,000 copies are printed per day. A staff of 125 students is responsible for the news and feature writing and the technical work of producing the paper which is supervised by the Publications Committee of the Council. The editor of the *Varsity* and the associate editors, heads of departments, are paid salaries by the Students' Administrative Council. *Torontonensis*, the annual year book, is produced each year, 1,350 copies being printed. Each member of the graduating class receives a book which is a very important historical record of undergraduate activities of the University. It contains the photograph and biography of every member of the graduating class, messages from the President and from the Deans of Faculties and Heads of Colleges, a photograph of every undergraduate organisation in the University as well as every athletic team in the University. It is a book very dear to every student in the graduating class. Both the Varsity and Torontonensis are great unifying forces in the University as students from every college and faculty in the University are on the staff of both these publications.

The Council again this year paid for one half the cost of printing the university directory of staff and students amounting to $756. Financial aid was given to the University Drama Committee and a contribution was made to the Student Conference in Winnipeg, in December. The Council holds membership in the National Federation of Canadian University Students and is, by far, the largest financial contributor to this organisation. The Debates Committee was responsible for arranging debates with other Universities. A debating team from the University of Melbourne, Australia, visited the University of Toronto in the fall, a contribution to their expenses being made by the Students' Administrative Council and they were entertained by the Council while visiting the University of Toronto. In co-operation with the Osgoode Hall Legal and Literary Society, the Council financed and made arrangements for a debate with two representatives from Laval University. This Debate was held in the Trinity College Library. The Council sent two representatives to McGill University to take part in an intercollegiate debate there. The Committee on Sporting Activities looked after the organisation and administration of the University of Toronto band. New uniforms were provided for the band at a cost of $1500 during the past year. The band has a membership of 55 students and is also a representative university organisation as students from every part of the University are members of the band. The Council sent the band to the out of town games with the football team and arranged for special excursions for students to these games as well. The band played at all the home games. The cheerleaders and the skits at half time at the Rugby games come directly under this Committee. In consultation with the men's and women's athletic directorates, the Students' Administrative Council recommended that a three dollar fee be imposed on all students which would cover their admission to football and hockey games to the stadium rink on certain days, the opening of Hart House athletic facilities at night and those of a women's building should such become available, as well as affiliations with outside clubs for certain sports for which the University lacks facilities. The undergraduate body voted by a great majority in favour of the plan and upon the request of the Council the Board of Governors imposed a fee for the 1937-38 session.

To train students in the field of symphonic music, the Students' Administrative Council organised the University of Toronto Symphony Orchestra, and purchased for this orchestra a valuable musical library to which additions are made each year. The orchestra is conducted by an undergraduate in the University and has more than 75 members at the present time, who like the members of the university band are selected from every constituent part of the University. The orchestra gives a concert, free of charge, for the student body in Convocation Hall each year.

The Council was host to a party of students from Finland comprising the Helsinki University Chorus in January. These students were welcomed by the President in the Senate Chamber and were given tea in Hart House by the Council. It was also host to a party of German Exchange students who visited the University in April.

The Loan Committee of the Council is composed of a member of the Board of Governors, Mr. J. J. Gibson, and the permanent officers of the Council. Mr. Gibson acts as chairman of the Committee. A total appropriation of $8500 has been made from the surplus funds of the Council for the purposes of loans. This has been of the greatest help to a large number of students making it possible for them to complete their university course and graduate. That this assistance has been greatly appreciated is shown by the fact that students make these loans a first charge on their earnings after they have become established, and repayments have been so satisfactory that to date it has been possible to loan $18000. The Council wishes to record the great debt it owes Mr. Gibson and to express its sincere thanks to him for his help in the administration of this fund. He has given freely of his time in interviewing students who apply for loans, and his judgment and wide experience are responsible more than any other single factor for the successful operation of this fund.

In addition to this loan fund a number of services have been carried on in the office of the Students' Administrative Council which have been of great value to the student body. The housing service is proving a great benefit to a large number of students. Rooms in boarding houses adjacent to the University are given a most rigid inspection during the summer months and the information is recorded on a card index in the Council office. As the Council is responsible to the owners of the houses for the students whom they send to them it is possible to get a much lower rate than the individual student could obtain. Each year, during the inspection a number of homes are recorded as not being proper places in which the students should live. Parents, of the first year students particularly, rely to a very great extent on the Students' Administrative Council to get the proper accommodation for their sons and daughters. One result of this activity has been that each year a number of homes are obtained who will provide free board and room in exchange for services about the house and this is of the greatest help to students who are in difficult financial circumstances. This was made possible for fifty-six students attending the University during the past year.

Recognising the need for some vocational guidance and employment service for students in the University, in 1933 an Employment Bureau was established. Contacts with employers were made first through the advertisers in the Council's publications. This year the employment bureau has become well known amongst employers owing to the fact that the persons sent to fill the various positions available were selected with care and proved satisfactory. The employment bureau is becoming one of the most important activities of the Students' Administrative Council. Many students rely to a great extent on this service to finance their university course. The bureau is chiefly concerned with providing summer, Christmas and part-time work, but in the past few years a number of permanent positions covering a wide field have been obtained for students when they graduate. During the past academic year, 1486 students were referred to positions and this year the number will be even larger. It is proposed

next year to establish a permanent committee of the Council on Student Employment and Assistance.

The employment bureau, the loan fund and the housing service have made possible a large number of students continuing their university course, finally graduating and becoming established in a profession which otherwise would not have been possible. So much have these services been appreciated by certain students, that, entirely unsolicited, this year a sum of money amounting to $900 was given to the Secretary-Treasurer of the Students' Administrative Council, without condition, to help worthy students who require assistance. The Council wishes to record its most grateful thanks to the donors of this money.

The activities of the Council so greatly increased that the office space in Hart House was not adequate to cope with the large number of students using the facilities of the Council. Consequently the Board of Governors provided increased accommodation in Hart House, and the Council now enjoys larger rooms which are satisfactory in every particular. The Council would like to record here its grateful appreciation to the President of the University for his whole-hearted and kindly interest in its affairs which is responsible in no small degree to larger space being provided. They also wish to record their appreciation and their sincere thanks to the Board of Governors of the University who provided the accommodation and to the acting Warden of Hart House, Mr. J. R. Gilley and the Board of Stewards of Hart House for their interest and their co-operation in this matter.

At the opening of term in October the members of the Council were guests of the President and Mrs. Cody at dinner. Members of the Council representing the student body took part in the service of remembrance at the Hart House tower on November 11th.

Dr. W. Bryden, Warden of the Students' Union of the University of Melbourne, Australia, visited the Council and attended a meeting in December. Dr. Hannah of the Associated Medical Services, also attended a meeting of the Council and explained to them the work of his department.

The Council this year were again hosts at the Garden Parties given on June 9th and 10th following the conferring of degrees. The President and Mrs. Cody, President of the Council, the Vice-Presidents of the Council, the President of the Engineering Society, the President of the Medical Society, and the President of the Dental Parliament received the guests at the Thursday Garden Party. At the Friday Garden Party, the President and Mrs. Cody, and the President and Vice-President of the Students' Council received the guests. Through the co-operation of the Council, the graduation ball was again held in Hart House on Friday, June 10th. This was again by far the largest social event of the year. 2,693 guests attended it. The arrangement for this function was carried out in the Council office.

A second hand Book Exchange is operated in the women's office for the benefit of all women students and many hundreds of books are brought in and resold each year.

APPENDIX B

REPORT OF THE REGISTRAR

(*A. B. Fennell, Esq., M.A.*)

I beg to submit the following statistics for the year ending June 30th, 1938:—

(*a*) Distribution of the staff of the University and University College (furnished by the Bursar).

(*b*) Distribution of the staffs of the federated Arts Colleges (furnished by the Registrars of the colleges).

(*c*) Registration of students by faculties and years.

(*d*) Enrolment in the Arts Colleges (furnished by the Registrars of the colleges).

(*e*) Enrolment in the university departments in Arts (furnished by the departments).

(*f*) Registration in courses in the Faculty of Arts.

(*g*) Registration in courses in the School of Graduate Studies (furnished by the Secretary of the School).

(*h*) Results of annual examinations (furnished by the Secretaries of the faculties).

(*i*) Admission to degrees.

(*j*) Admission to diplomas and certificates.

(*k*) Geographical distribution of students (furnished by the Secretaries of the faculties).

(*a*) Distribution of the Staff of the University and University College:

	Professors	Associate Professors	Assistant Professors	Associates	Lecturers	Directors	Assistant Directors	Instructors	Other Sessional Appointments
University (Faculty of Arts).....	42	33	34	—	30	—	—	—	136
University College.....	15*a*	8	10	—	8	—	—	—	3
Faculty of Medicine.....	27*b*	12	30	28	19*c*	—	—	—	190
Faculty of Applied Science and Engineering.....	14	11	12	—	21	—	—	—	51
Faculty of Household Science....	2	—	2	—	5	—	—	—	8
Ontario College of Education....	8	4	4	—	26*a*	—	—	26	—
Faculty of Forestry.....	2	2	1	—	1	—	—	—	—
Faculty of Music.....	—	—	—	—	4	—	—	—	—
Faculty of Dentistry.....	10	7	1*d*	23	3*d*	—	—	—	6
Social Science.....	1	—	—	—	17*e*	—	1	—	—
School of Nursing.....	—	—	—	—	46*f*	1	1	2	—

a 1 also in University
b 1 also in Arts
c 2 also in Dentistry; 1 also in Applied Science; 1 also in Ontario College of Education
d 1 also in Medicine
e 1 also in Arts; 1 also in Dentistry
f 1 also in Arts; 20 also in Medicine; 1 also in Dentistry; 2 also in Ontario College of Education

(*b*) Distribution of the Staffs of the Federated Arts Colleges:

	Victoria College	Trinity College	St. Michael's College
Professors.....	11	13	14
Associate professors.....	6	4	7
Assistant professors.....	5	..	1
Lecturers.....	10	3	16
Instructors.....	4	..	13
Fellows.....	5	2	..
Readers.....	1	2	..

(c) Registration of Students by Faculties and Years:

The number of students registered in the university, in colleges and faculties, in the session 1937-38 was 7,232, distributed as follows:

				Men	Women	Total
Faculty of Arts				2,239	1,724	3,963
University of Toronto	733	516	1,249			
University College	610	502	1,112			
Victoria College	416	453	869			
Trinity College	227	136	363			
St. Michael's College	253	117	370			
Faculty of Medicine				771	72	843
Faculty of Applied Science and Engineering				832	1	833
Faculty of Household Science				...	41	41
Ontario College of Education				379	330	709
Faculty of Forestry				31	...	31
Faculty of Music				28	21	49
School of Graduate Studies				432	151	583
Faculty of Dentistry				190	22	212
Registered twice				22	10	32
				4,880	2,352	7,232

In departments there were registered 628, distributed as follows:

Department of Social Science	9	55	64
School of Nursing	...	466	466
Physical Education for Women	...	24	24
University Extension (Occupational Therapy)	...	40	40
University Extension (Physiotherapy)	...	34	34
	9	619	628

The grand total of registration for the whole university was 7,841, of whom 4,889 were men and 2,952 were women.

In addition there were 5,801 persons registered in the Department of University Extension in courses and at provincial centres which are referred to in detail in Appendix A (14).

The figures may be further analysed as follows:

Faculty of Arts

University of Toronto

	Men	Women	Total
Teachers' Classes and Summer Session	447	478	925
Occasional Arts students	286	38	324
	733	516	1,249

University College

	Men	Women	Total
First year undergraduates	191	191	382
Second year undergraduates	165	145	310
Third year undergraduates	156	103	259
Fourth year undergraduates	90	55	145
Occasional students	8	8	16
	610	502	1,112

Victoria College

	Men	Women	Total
First year undergraduates	129	139	268
Second year undergraduates	121	122	243
Third year undergraduates	96	128	224
Fourth year undergraduates	67	60	127
Occasional students	2	2	4
Exchange Students	1	2	3
	416	453	869

Trinity College

	Men	Women	Total
First year undergraduates	56	56	112
Second year undergraduates	78	32	110
Third year undergraduates	61	33	94
Fourth year undergraduates	30	14	44
Occasional students	2	1	3
	227	136	363

St. Michael's College

	Men	Women	Total
First year undergraduates	107	37	144
Second year undergraduates	54	37	91
Third year undergraduates	76	35	111
Fourth year undergraduates	16	8	24
	253	117	370

Faculty of Medicine

	Men	Women	Total
First year undergraduates	128	15	143
Second year undergraduates	124	13	137
Third year undergraduates	134	10	144
Fourth year undergraduates	128	10	138
Fifth year undergraduates	125	11	136
Sixth year undergraduates	103	10	113
Candidates for Degree of B.Sc. (Med.)	4	..	4
Candidates for Diploma in Psychiatry	4	2	6
Candidates for Diploma in Public Health	17	1	18
Candidate for Diploma in Radiology	1	..	1
Graduate students	3	..	3
	771	72	843

Faculty of Applied Science and Engineering

	Men	Women	Total
First year undergraduates	276	..	276
Second year undergraduates	226	1	227
Third year undergraduates	174	..	174
Fourth year undergraduates	148	..	148
Fifth year undergraduates	8	..	8
	832	1	833

Faculty of Household Science

	Men	Women	Total
First year undergraduates	..	6	6
Second year undergraduates	..	5	5
Third year undergraduates	..	24	24
Fourth year undergraduates	..	4	4
Occasional students	..	2	2
	..	41	41

Ontario College of Education

	Men	Women	Total
Students in attendance	123	218	341
Extra-mural students	91	93	184
Students in B.Paed. course	170	20	190
Registered twice	5	1	6
	379	330	709

Faculty of Forestry

	Men	Women	Total
First year undergraduates	8	...	8
Second year undergraduates	12	...	12
Third year undergraduates	5	...	5
Fourth year undergraduates	6	...	6
	31	...	31

Faculty of Music

	Men	Women	Total
First year undergraduates	6	2	8
Second year undergraduates	13	3	16
Third year undergraduates	9	16	25
	28	21	49

School of Graduate Studies

	Men	Women	Total
Candidates for Degree of Ph.D	101	17	118
Candidates for Degree of M.A	116	57	173
Candidates for Degree of M.S	3	...	3
Candidates for Degree of M.A.Sc	12	...	12
Candidates for Degree of C.E	1	...	1
Candidates for Degree of Mech.E	1	...	1
Candidates for Degree of D.Paed	45	1	46
Candidates for Degree of M.Sc. (Dent.)	1	...	1
Candidates for Degree of M.S.A	20	...	20
Candidates for Degree of Mus.Doc	3	...	3
Graduate students	129	76	205
	432	151	583

Faculty of Dentistry

	Men	Women	Total
First year undergraduates	31	...	31
Second year undergraduates	47	1	48
Third year undergraduates	39	...	39
Fourth year undergraduates	35	1	36
Fifth year undergraduates	32	1	33
Candidates for Degree of B.Sc. (Dent.)	5	...	5
Candidates for Diploma in Dental Nursing	...	19	19
Occasional student	1	...	1
	190	22	212

Department of University Extension

	Men	Women	Total	Grand Total
B.A. Course				
Summer Session:				
Regular students	142	167	309	...
Occasional students	4	5	9	318
Teachers' Classes:				
Toronto:				
Regular students	319	301	620	...
Occasional students	21	7	28	...
Brampton:				
Regular students	9	11	20	...
Port Arthur:				
Regular Students	2	8	10	678
Specialists' Courses				
Summer Session:				
Regular students	13	4	17	17
Registered twice	63	25	88	88
	447	478	925	925

Department of Social Science

	Men	Women	Total
First year full-time students	4	21	25
Second year full-time students	3	13	16
Part-time students	2	21	23
	9	55	64

School of Nursing

	Men	Women	Total
Full-time students	...	106	106
Part-time students	...	360	360
	...	466	466

(*d*) Enrolment in the Arts Colleges

(1) University College:

	English	Ethics	French	German	German (Sc.)	Greek	Greek and Roman History	Latin	Oriental History	Oriental Languages	Oriental Literature
First Year—											
Pass	181	14	217	39	54	8	19	11	1	20	107
Honour	55	..	39	18	..	4	22	24	3	1	..
Second Year—											
Pass	152	21	154	25	31	6	12	3	14	8	109
Honour	29	15	26	13	..	3	4	13	2	..	.
Third Year—											
Pass	99	93	60	8	..	9	28	17	13	9	87
General	2	..	1	..	..	..	..	1	1	..	..
Honour	23	32	16	8	..	5	6	11	2	2	..
Fourth Year—											
Pass	..	..	..	..	..	5	26	..	..	..	55
General	2	2	2	..	..	..	..	..	..	..	..
Honour	24	8	21	16	..	3	3	10	3	3	..
Totals—											
Pass	432	128	431	72	85	28	85	21	28	37	358
General	4	2	3	..	..	..	..	1	1	..	..
Honour	131	55	102	55	..	15	35	58	10	6	..
Teachers' Classes	137	..	33	5	..	..	..	6	..	..	..
Graduate Studies	63	..	18	8	..	4	3	4	..	8	..
Other Faculties	..	9	149	217	..	..	..	..	..	..	..
Grand Total	767	194	736	357	85	47	123	90	39	51	358

(2) Victoria College:

	English	Ethics	French	German	German (Sc.)	Greek	Greek and Roman History	Latin	Oriental History	Oriental Languages	Religious Know.
First Year—											
Pass	118	16	133	16	37	3	29	6	3	3	103
Honour	40	..	39	18	..	7	14	24	2	..	...
Second Year—											
Pass	80	37	78	10	30	7	9	5	2	3	100
Honour	33	9	38	26	..	5	5	15	2	2	..
Third Year—											
Pass	94	36	51	13	..	6	36	4	3	4	98
General	11	1	8	4	..	1	1	1	..	..	..
Honour	25	18	19	14	..	1	1	10	..	..	..
Fourth Year—											
Pass	..	17	..	..	..	..	20	..	..	..	55
General	1	2	1	1	..	..	1	..	..	..	..
Honour	22	12	18	16	..	8	7	8	..	..	..
Totals—											
Pass	292	106	262	39	67	16	94	15	8	10	356
General	12	3	9	5	..	1	2	1	..	..	..
Honour	120	39	114	74	..	21	27	57	4	2	..
Teachers' Classes	60	..	25	..	..	..	..	..	..	..	..
Graduate Studies	14	..	4	5	..	1	1	5	1	1	..
Grand Total	498	148	414	123	67	39	124	78	13	13	356

(3) Trinity College:

	English	Ethics	French	German	German (Sc.)	Greek	Greek and Roman History	Latin	Oriental History	Oriental Languages	Religious Know.
First Year—											
Pass	48	2	77	12	14	2	7	2	..	..	96
Honour	17	2	10	5	..	..	3	5	..	..	..
Second Year—											
Pass	44	17	28	3	4	..	1	2	..	..	99
Honour	12	4	4	8	..	3	3	3	..	..	..
Third Year—											
Pass	23	12	21	2	..	..	..	4	..	..	86
General	1	1	2	1	..	1	1	1	..	..	..
Honour	13	4	7	7	..	..	1	2	..	..	..
Fourth Year—											
Pass	..	..	..	..	..	..	..	..	..	..	40
General	..	..	..	..	..	1	1	1	..	..	..
Honour	7	2	4	..	..	5	5	5	..	..	..
Totals—											
Pass	115	31	126	17	18	2	8	8	..	..	321
General	1	1	2	1	..	2	2	2	..	..	..
Honour	49	12	25	20	..	8	12	15	..	..	..
Grand Total	165	44	153	38	18	12	22	25	..	..	321

(4) St. Michael's College:

	English	Ethics	French	German	German (Sc.	Greek	Greek and Roman History	Latin	Philosophy	Religious Know.
First Year—										
Pass	65	23	59	3	12	2	5	41	59	112
Honour	17	..	8	2	..	2	10	10	11	..
Second Year—										
Pass	47	27	35	5	1	7	..	26	48	72
Honour	5	4	12	2	..	1	7	8	4	..
Third Year—										
Pass	52	36	44	10	..	3	..	33	46	87
Honour	11	14	6	2	..	..	2	4	14	..
Fourth Year—										
Pass	..	..	..	..	..	..	..	..	1	19
Honour	5	6	5	4	..	2	..	4	6	..
Totals—										
Pass	164	86	138	18	13	12	5	100	154	290
Honour	38	24	31	10	..	5	19	26	35	..
Grand Total	202	110	169	28	13	17	24	126	189	290

(e) Enrolment in the University Departments in Arts:

The following tables exhibit the numbers attending lectures in the university departments in the Faculty of Arts, together with the number of those taking the practical work in the laboratories :

Department of Anthropology

	Pass	Pass and Honour	Honour
Faculty of Arts—			
First Year	137	80	24
Second Year	..	7	23
Third Year	..	1	16
Fourth Year	..	38	14
School of Graduate Studies	..	..	12
Department of Social Science—			
First Year	..	..	13
Totals	137	126	102

Department of Applied Mathematics

	Pass	Pass and Honour	Honour
Faculty of Arts—			
First Year	8	..	..
Second Year	5	..	30
Third Year	..	..	27
Fourth Year	..	..	17
Occasional Students	..	..	1
Faculty of Applied Science and Engineering—			
Second Year	..	35	..
Third Year	..	6	..
Fourth Year	..	6	..
School of Graduate Studies	..	..	17
Totals	13	47	92

Department of Archaeology

	Lecture Courses
	1 or 2 or 3 hours
	Honour
Faculty of Arts—	
First Year	10
Second Year	17
Third Year	7
Fourth Year	16
Totals	50

Department of Astronomy

	Pass	Pass and Honour	Honour	Laboratory
Faculty of Arts—				
First Year	12	..	..	12
Second Year	7	35	..	7
Third Year	5	..	16	21
Fourth Year	..	..	8	1
Faculty of Applied Science and Engineering—				
Second Year	..	..	14	..
Totals	42	35	38	41

Department of Biology

	Lecture Courses			Laboratory Courses	
	1 or 2 or 3 hours		4 or 5 or 6 hours		
	Pass	Honour	Honour	Pass	Honour
Faculty of Arts—					
First Year	208	113	..	97	113
Second Year	72	93	..	72	93
Third Year	57	32	9	57	24
Fourth Year	..	12	2	..	15
Occasional Students	..	2	..	..	2
Faculty of Medicine—					
First Year	..	145	..	..	145
Third Year	..	7	..	..	1
Faculty of Household Science—					
First Year	..	8	..	..	8
Faculty of Forestry—					
First Year	..	8	..	..	8
Fourth Year	..	6	..	..	6
School of Graduate Studies	..	..	..	..	38
Faculty of Dentistry—					
First Year	..	31	..	..	31
School of Nursing	15	..	..	15	..
College of Optometry of Canada	..	34	..	..	34
Totals	352	491	11	241	518

Department of Botany

	Lecture Courses		Laboratory Courses	
	1 or 2 or 3 hours			
	Pass	Honour	Pass	Honour
Faculty of Arts—				
First Year	9	122	9	122
Second Year	14	14	14	14
Third Year	13	5	13	5
Fourth Year	..	5	..	5
Occasional Students	2	7	..	7
Faculty of Applied Science and Engineering—				
First Year	..	..	68	..
Faculty of Household Science—				
First Year	7	..	7	..
Faculty of Forestry—				
First Year	..	8	..	8
Fourth Year	..	..	..	6
School of Graduate Studies	..	21	..	..
Ontario Agricultural College	..	2	..	..
Ontario College of Pharmacy				
First Year	121	..	121	..
Second Year	104	..	104	..
Totals	270	184	336	167

Department of Chemistry

	Pass	Pass and Honour	Honour	Laboratory
Faculty of Arts—				
First Year	195	..	167	253
Second Year	56	..	93	121
Third Year	37	..	26	56
Fourth Year	1	..	15	15
Occasional Students	..	..	7	1
Faculty of Medicine—				
First Year	..	150	..	150
Second Year	..	126	..	104
Faculty of Applied Science and Engineering—				
First Year	..	83	..	83
Second Year	..	87	..	86
Third Year	..	125	..	123
Fourth Year	..	11	..	11
Faculty of Household Science—				
First Year	..	6	..	6
Second Year	..	4		..
Faculty of Forestry—				
First Year	8	..	..	8
Second Year	11	..	..	3
School of Graduate Studies	..	..	64	26
Faculty of Dentistry—				
First Year	..	31	..	31
Second Year	..	47	..	47
Third Year	..	39	..	39
Ontario College of Pharmacy—				
First Year	122	..	..	122
Second Year	104	..	..	104
Totals	534	709	372	1,389

Department of Fine Art

	Pass	Pass and Honour	Honour
Faculty of Arts—			
First Year	26	..	8
Second Year	33	17	6
Third Year	31	22	..
Fourth Year	..	24	..
Occasional Students	5	..	..
School of Graduate Studies	5	..	..
Totals	100	63	14

Department of Food Chemistry
(Faculty of Household Science)

	Pass	Pass and Honour	Honour	Laboratory
Faculty of Arts—				
Second Year	31	..	..	31
Third Year	14	..	..	14
Fourth Year	..	..	28	28
Faculty of Household Science—				
Second Year	..	5	..	5
Third Year	18	..	..	18
Fourth Year	..	..	4	4
School of Graduate Studies	..	..	4	4
Totals	63	5	36	104

Department of Geography

	Pass	Pass and Honour	Honour	Laboratory
Faculty of Arts—				
First Year	..	170	..	170
Second Year	..	75	..	75
Teachers' Classes	..	125	..	125
Ontario College of Education	250	..	..	..
School of Graduate Studies	..	..	1	..
Totals	250	370	1	370

Department of Geology and Palaeontology

	Lecture Courses					Laboratory Courses	
	1 or 2 or 3 hours		4 or 5 or 6 hours		7 or more hours		
	Pass	Honour	Pass	Honour	Honour	Pass	Honour
Faculty of Arts—							
First Year	128	57	..	..	..	..	..
Second Year	45	23	..	..	..	24	23
Third Year	9	..	..	12	..	9	12
Fourth Year	..	..	..	5	4	..	10
Teachers' Classes	117	..	..	..	..	117	..
Occasional Students	2	..	..	..	..	..	..
Faculty of Applied Science and Engineering—							
Second Year	92	..	..	..	..	34	..
Third Year	50	..	2	..	..	32	..
Fourth Year	32	..	..	..	..	32	..
Faculty of Forestry—							
Second Year	12	..	..	..	..	..	..
Third Year	5	..	..	..	..	..	..
School of Graduate Studies	..	..	..	8	10	..	19
Totals	492	80	2	25	14	248	64

Department of History

	Lecture Courses			
	1 or 2 or 3 hours		4 or 5 or 6 hours	7 or more hours
	Pass	Honour	Honour	Honour
Faculty of Arts—				
First Year	117	140	..	..
Second Year	120	26	55	..
Third Year	80	..	79	10
Fourth Year	2	..	39	5
Teachers' Classes	56	..	..	..
Occasional Students	2	1	2	..
School of Graduate Studies	..	10	22	..
Department of University Extension Evening Classes	50	..	..	..
Totals	427	177	197	15

Department of Household Science
(Faculty of Household Science)

	Pass	Pass and Honour	Honour	Laboratory
Faculty of Arts—				
First Year	..	..	56	..
Second Year	16	..	33	49
Third Year	9	3	30	42
Fourth Year	..	..	26	26
Faculty of Household Science—				
First Year	..	5	..	..
Second Year	..	5	..	5
Third Year	18	..	5	23
Fourth Year	..	..	4	4
School of Graduate Studies	..	..	3	1
Totals	43	13	157	150

Department of Italian and Spanish

	Italian		Spanish	
	Pass	Honour	Pass	Honour
Faculty of Arts—				
First Year	30	10	90	22
Second Year	18	7	77	33
Third Year	16	4	49	14
Fourth Year	..	5	2	4
School of Graduate Studies	..	2	..	8
Totals	64	28	218	81

Department of Law

	Pass	Honour
Faculty of Arts—		
First Year	..	106
Second Year	..	31
Third Year	..	28
Fourth Year	..	30
Faculty of Applied Science and Engineering—		
Third Year	50	..
Faculty of Forestry—		
Third Year	8	..
School of Graduate Studies	..	9
Department of University Extension—		
Evening Classes	35	..
Bachelor of Laws Course	..	12
Totals	93	216

Department of Mathematics

	Lecture Courses					
	1 or 2 or 3 hours		4 or 5 or 6 hours		7 or more hours	
	Pass	Honour	Pass	Honour	Pass	Honour
Faculty of Arts—						
First Year	95	70	..	..	..	60
Second Year	90	6	..	..	..	25
Third Year	60	4	..	..	..	23
Fourth Year	..	5	..	..	..	8
Teachers' Classes	15	..	..	..	..	..
Occasional Students	1	1	..	..	..	1
Faculty of Applied Science and Engineering—						
First Year	237	..	13	..	..	..
Second Year	130	..	10	..	..	..
Faculty of Forestry—						
First Year	10	..	..	..	..	..
School of Graduate Studies	..	8	..	10	..	..
College of Optometry of Canada	20	..	..	..	..	..
Totals	658	94	23	10	..	117

Department of Military Studies

	Pass	Pass and Honour
Faculty of Arts—		
First Year	14	14
Second Year	8	8
Third Year	8	3
Fourth Year	4	1
Faculty of Medicine—		
First Year	7	..
Second Year	9	..
Third Year	1	..
Fourth Year	1	..
Fifth Year	4	..
Sixth Year	2	..
Faculty of Applied Science and Engineering—		
First Year	23	..
Second Year	12	..
Third Year	2	..
Fourth Year	3	..
Faculty of Forestry—		
Second Year	1	..
School of Graduate Studies	3	..
Faculty of Dentistry—		
First Year	1	..
Fifth Year	1	..
Ontario College of Pharmacy—		
First Year	5	..
Second Year	1	..
Totals	110	26

Department of Mineralogy and Petrography

	Pass	Pass and Honour	Honour	Laboratory
Faculty of Arts—				
First Year	12	..	..	12
Second Year	2	..	29	31
Third Year	..	4	19	16
Fourth Year	..	..	10	9
Teachers' Classes	116	..	..	116
Occasional Students	1	..	..	1
Faculty of Applied Science and Engineering—				
First Year	..	157	..	157
Second Year	..	57	..	57
Third Year	..	29	..	29
Fourth Year	..	6	..	6
Faculty of Forestry—				
Second Year	..	6	..	13
School of Graduate Studies	..	..	11	11
Totals	131	266	69	458

Department of Music

	Lecture Courses
	4 or 5 or 6 hours
	Honour
Faculty of Arts—	
First Year	8
Total	8

Department of Philosophy

	Pass	Honour
Faculty of Arts—		
First Year	50	103
Second Year	129	65
Third Year	185	83
Fourth Year	21	54
Teachers' Classes	36	..
School of Graduate Studies	..	61
Department of Social Science—		
First Year	9	..
Totals	430	366

Department of Physics

	Pass	Pass and Honour	Honour	Laboratory
Faculty of Arts—				
First Year	192	..	170	237
Second Year	29	..	69	81
Third Year	30	..	41	66
Fourth Year	..	..	36	28
Candidates for Specialists' Certificates, Summer Session	..	..	5	5
Faculty of Medicine—				
First Year	..	149	..	149
Diploma in Radiology	..	1	..	1
Faculty of Applied Science and Engineering—				
First Year	..	..	16	16
Second Year	..	..	13	13
Third Year	..	..	6	6
Fourth Year	..	..	6	6
Faculty of Household Science—				
First Year	..	..	6	6
Candidates for Specialists' Certificates	..	..	1	1
Faculty of Forestry—				
First Year	8	..	..	8
School of Graduate Studies	..	..	57	32
Faculty of Dentistry—				
First Year	..	31	..	31
Department of University Extension—				
Physiotherapy	19	..	..	19
College of Optometry of Canada	..	35	..	35
Totals	278	216	426	740

Department of Political Science

	Lecture Courses					
	1 or 2 or 3 hours		4 or 5 or 6 hours		7 or more hours	
	Pass	Honour	Pass	Honour	Pass	Honour
Faculty of Arts—						
First Year	148	108	..	73	..	..
Second Year	169	19	..	..	..	83
Third Year	144	37	..	..	..	77
Fourth Year	35	29	..	..	1	61
Teachers' Classes	36	..	..	..	..	..
Occasional Students	2	1	1	..	..	..
Faculty of Household Science—						
Second Year	4	..	..	..	..	..
Third Year	11	..	..	..	..	..
Faculty of Forestry—						
Third Year	4	..	..	..	..	..
School of Graduate Studies	..	..	..	..	..	28
Totals	553	194	1	73	1	249

Department of Psychology

	Lecture Courses				Laboratory Courses	
	1 or 2 or 3 hours		4 or 5 or 6 hours	7 or more hours		
	Pass	Honour	Pass	Honour	Pass	Honour
Faculty of Arts—						
First Year.....	191	50	..	..	..	..
Second Year.....	..	..	..	14	152	32
Third Year.....	89	36	7	11	..	11
Fourth Year.....	25	33	4	8	..	8
Teachers' Classes..	118	..	..	..	..	..
Teachers' Classes, Correspondence.	34	..	..	..	..	..
Occasional Students	..	..	..	..	2	..
Faculty of Medicine—						
Second Year.....	142	..	..	..	..	..
Third Year.....	..	..	..	..	9	..
Fourth Year.....	13	..	..	..	..	..
Faculty of Household Science—						
First Year.....	24	..	..	..	..	..
School of Graduate Studies.....	40	..	..	..	..	24
Faculty of Dentistry—						
Graduate Students	1	..	..	..	..	..
Department of Social Science—						
First Year.....	15	..	..	..	..	..
Second Year.....	15	..	..	..	..	..
School of Nursing...	67	..	..	..	..	..
Department of University Extension—						
Occupational Therapy.....	38	..	..	..	..	..
Physiotherapy....	21	..	..	..	..	..
Centralised Pupil Nurses.....	290	..	..	..	..	..
Evening Classes...	259	..	..	..	..	..
Workers' Educational Education	99	..	..	..	..	..
College of Optometry of Canada.....	66	..	..	..	..	..
Totals.....	1,547	119	11	33	163	75

(f) Registration in Courses in the Faculty of Arts

Courses	First Year						Second Year						Third Year						Fourth Year						Totals
	U C		V C		T C	M C	U C		V C	T C	M C		U C		V C	T C	M C		U C		V C	T C	M C		
Pass	143		117		51	99	149		93	52	69		98		91	35	76		..		..	..	..		1,073
General	..		..		..	..	..		..	..	..		7		17	5	3		6		11	2	..		51
Classics	3		6		..	1	3		3	3	1		6		1	..	..		2		4	5	1		39
English Language and Literature	20		20		4	6	10		17	1	1		..		..	..	..		..		..	..	..		79
Greek and Hebrew	..		..		..	..	..		1	..	..		..		..	..	..		..		..	..	..		1
Hebrew and Ancient History	..		..		..	..	..		..	..	..		..		..	..	..		..		..	..	..		..
Latin (French or Greek Option) Div. I	1		2		2	2	1		2	..	6		1		3	1	2		..		..	2	1		30
Latin (French or Greek Option) Div II							..		..	..	..		..		..	..	..		1		3	..	..		
Modern Languages	21		13		7	1	16		20	3	5		15		16	8	4		22		17	1	4		173
Oriental Languages	1		..		..	..	..		2	..	..		2		..	..	..		3		..	..	..		8
English and History	..		..		..	..	..		..	..	..		6		12	3	4		9		10	3	2		49
Fine Art	5		2		..	1	3		2	1	..		..		..	..	..		..		..	..	..		14
Law	26		5		1	1	15		6	7	1		23		2	3	..		17		6	5	1		119
Music	..		7		..	1	..		..	..	..		..		..	..	..		..		..	..	..		8
Social and Philosophical Studies	48		18		14	5	..		..	..	..		..		..	..	..		..		..	..	..		85
Modern History	..		..		..	..	8		5	5	..		4		2	4	..		1		3	1	..		33
Philosophy	..		..		..	..	3		1	..	2		1		5	1	8		2		1	..	4		28
Philosophy (English or History Option)	4		4		2	6	1		1	4	2		3		5	4	7		4		10	2	2		61
Political Science and Economics	..		..		..	..	10		11	11	1		7		6	11	1		17		6	6	1		88
Psychology	..		..		..	..	11		2	..	..		5		5	1	..		3		4	1	..		32
Sociology	..		..		..	..	6		7	2	..		5		8	..	..		5		8	..	..		41
Mathematics and Physics (Div. I)													1		3	1	..		4		2	1	1		
Mathematics and Physics (Div. II)													5		1	1	1		3		2	..	..		
Mathematics and Physics (Div. III)	18		21		5	6	13		9	3	..		1		..	..	..		1		..	..	..		116
Mathematics and Physics (Div. IV)													6		2	1	..		1		1	1	..		
Mathematics and Physics (Div. V)																			..		1	..	..		
Physics and Chemistry	..		..		..	..	2		2	..	1		3		..	..	..		..		1	2	..		11
Physics and Geology	..		..		..	..	..		..	..	..		1		..	..	..		..		..	..	..		1
Science	26		15		8	7	..		..	..	..		..		..	..	..		..		..	..	..		56
Biological and Medical Sciences	..		..		..	..	7		5	3	..		5		6	1	1		9		3	2	2		44
Biology	..		..		..	..	1		2	1	..		2		1	2	..		1		1	..	..		11
Biology and Physics	..		..		..	..	1		1	..	..		..		..	..	..		..		..	..	..		2
Chemistry	..		..		..	..	5		6	..	1		4		1	2	..		3		5	2	..		29
Chemistry, Mineralogy and Geology, Div. I	..		..		..	..	2		7	1	..		..		..	..	..		..		..	1	..		21
Chemistry, Mineralogy and Geology, Div. II	..		..		..	..							3		2	1	..		2		1	1	..		
Food Chemistry	..		..		..	..	..		..	..	..		..		..	..	..		..		..	..	..		..
Geology and Mineralogy	..		..		..	..	3		5	..	..		2		2	..	..		1		2	1	..		16
Household Economics	28		19		4	5	16		17	1	..		15		13	2	..		8		15	2	2		147
Physics	..		..		..	..	..		..	..	..		2		1	..	1		..		1	1	..		6
Physiology and Biochemistry	..		..		..	..	2		1	..	..		3		1	..	..		..		2	..	..		9
Science (General)	..		..		..	..	..		..	..	..		..		..	..	..		..		1	..	..		1
Commerce and Finance	38		19		14	3	22		16	12	1		23		18	7	3		20		6	2	3		207
Exchange Students	..		..		..	..	..		3	..	..		..		..	..	..		..		..	..	..		3
Registered twice	..		..		..	..	..		1	..	..		..		..	..	..		..		..	..	..		1
Totals	382		268		112	144	310		246	110	91		259		224	94	111		145		127	44	24		2,691

(g) Registration in Courses in the School of Graduate Studies

Department	Ph.D.	M.A.	M.S.	M.A. Sc.	C.E.	Mech.E.	D. Paed.	Mus. Doc.	M.Sc. (Dent.)	M.S.A.	Grad. Stud.	Auditor
Anatomy	..	1	..	..	..	..	..	..	..	..	..	..
Anthropology	..	1	..	..	..	..	..	..	..	..	3	1
Applied Mathematics	2	3	..	..	..	..	..	..	..	..	..	..
Architecture	..	..	..	..	..	..	..	..	..	..	1	..
Biochemistry	9	1	..	..	..	..	..	..	..	..	3	..
Biology	10	5	..	..	..	..	..	..	..	3	12	..
Botany	11	2	..	..	..	..	..	..	..	6	2	..
Chemistry	16	17	..	..	..	..	..	..	..	6	1	..
Chemical Engineering	3	..	..	6	..	..	..	..	..	..	..	1
Chinese Archaeology	1	2	..	..	..	..	..	..	..	..	..	..
Civil Engineering	..	..	..	2	..	..	..	..	..	..	..	..
Classics	4	10	..	..	..	..	..	..	..	..	4	..
Dentistry	..	..	..	..	..	..	..	..	1	..	..	..
Educational Theory	1	..	..	..	..	..	..	..	..	..	1	..
Electrical Engineering	..	..	..	1	..	..	..	..	..	..	..	1
English	..	17	..	..	..	..	..	..	..	..	36	..
Food Chemistry	..	2	..	..	..	..	..	..	..	..	1	..
Geography	..	1	..	..	..	..	..	..	..	..	1	..
Geology and Palaeontology	3	4	..	..	..	..	..	..	..	..	8	..
Germanic Languages	1	3	..	..	..	..	..	..	..	..	4	..
History	6	7	..	..	..	..	..	..	..	..	18	..
Household Science	..	3	..	..	..	..	..	..	..	..	..	..
Hygiene and Preventive Medicine	..	..	..	..	..	..	..	..	..	3	1	..
Law	..	2	..	..	..	..	..	..	..	..	2	..
Mathematics	1	4	..	..	..	..	..	..	..	..	5	..
Mechanical Engineering	2	..	..	3	..	..	..	..	..	..	..	..
Mineralogy	1	2	..	..	..	..	..	..	..	..	..	..
Music	..	..	..	..	..	..	..	3	..	..	..	..
Pathological Chemistry	4	..	..	..	..	..	..	..	..	..	..	..
Pedagogy	..	..	..	..	..	..	46	..	..	..	..	..
Pharmacology	2	..	..	..	..	..	..	..	..	..	..	1
Philosophy	12	20	..	..	..	..	..	..	..	..	27	..
Physics	10	22	..	..	..	..	..	..	..	..	4	..
Physiology	4	5	..	..	..	..	..	..	..	..	..	..
Physiological Hygiene	3	..	..	..	..	..	..	..	..	..	..	..
Political Science	5	7	..	..	..	..	..	..	..	1	10	..
Preventive Dentistry	1	..	..	..	..	..	..	..	..	..	1	..
Professional Degrees	..	..	..	..	1	1	..	..	..	..	..	..
Psychiatry	..	..	..	..	..	..	..	..	..	..	1	..
Psychology	6	14	..	..	..	..	..	..	..	..	17	2
Romance Languages	..	8	..	..	..	..	..	..	..	..	19	..
Semitic Languages	..	4	..	..	..	..	..	..	..	..	4	..
Surgery	..	..	3	..	..	..	..	..	..	..	..	..
Special Committees	..	6	..	..	..	..	..	..	..	1	13	..
Totals	118	173	3	12	1	1	46	3	1	20	199	6

(*h*) Results of the Annual Examinations

Faculty of Arts

First Year

Course	University of Toronto	Univ. Coll.	Vic. Coll.	Trin. Coll.	St. M. Coll.	TOTALS	Passed	Conditioned	Failed	Transferred	Aegrotat	Debarred
Pass	..	140	111	50	94	395	254	70	71	..	6	77
Supplementals	..	37	17	10	13	77	52	25	..	..	..	..
Classics	..	3	6	..	1	10	8	1	1	..	..	..
English Language and Literature	..	18	20	4	5	47	36	2	9	9	..	2
Latin (French or Greek Option)	..	1	2	2	2	7	7	..	..	..	..	..
Modern Languages	..	21	13	7	1	42	31	4	7	5	..	..
Oriental Languages	..	1	..	..	..	1	..	1	..	..	..	..
Fine Art	..	5	2	..	1	8	7	..	1	1	..	1
Law	..	26	5	1	1	33	27	5	1	1	..	3
Social and Philosophical Studies	..	47	16	14	5	82	56	13	13	10	2	2
Music	..	..	7	1	..	8	6	..	2	2	..	2
Philosophy (English or History Option)	..	4	4	2	6	16	11	2	3	3	..	..
Mathematics and Physics	..	17	19	5	4	45	29	10	6	1	..	2
Science	..	25	12	8	6	51	39	6	6	2	..	2
Household Economics	..	28	18	4	5	55	39	7	9	8	3	3
Commerce and Finance	..	38	19	13	3	73	38	17	18	8	1	4
Occasional Students	5	3	..	..	1	9	8	1	..	..	..	..
Totals	5	414	271	121	148	959	648	164	147	50	12	98

Second Year

Course	University of Toronto	Univ. Coll.	Vic. Coll.	Trin. Coll.	St. M. Coll.	TOTALS	Passed	Conditioned	Failed	Aegrotat	Debarred
Pass	..	147	90	52	65	354	259	65	30	10	19
Supplementals	..	24	8	11	6	49	41	8	..	..	..
Classics	..	3	3	3	1	10	10	..	..	..	..
English Language and Literature	..	10	17	1	1	29	21	2	6	..	..
Greek and Hebrew	..	..	1	..	..	1	1	..	..	..	..
Latin (French or Greek Option) Div. I.	..	1	2	..	6	9	7	..	2	..	..
Modern Languages	..	16	19	3	5	43	35	1	7	..	..
Oriental Languages	..	..	2	..	..	2	2	..	..	..	..
Fine Art	..	3	2	1	..	6	6	..	..	..	..
Law	..	14	6	6	1	27	24	1	2	1	..
Modern History	..	8	5	5	..	18	18	..	..	1	..
Philosophy	..	3	1	..	2	6	5	1	..	2	1
Philosophy (English or Hist. Option)	..	1	1	4	2	8	7	..	1	1	..
Political Science and Economics	..	9	11	11	1	32	24	2	6	1	..
Psychology	..	11	2	..	..	13	13	..	..	..	..
Sociology	..	7	7	2	..	16	14	1	1	2	..
Mathematics and Physics	..	12	9	3	..	24	13	1	10	..	..
Physics and Chemistry	..	2	2	..	1	5	3	..	2	..	..
Biological and Medical Sciences	..	7	5	2	..	14	6	6	2	..	2
Biology	..	1	2	1	..	4	3	..	1	1	..
Biology and Physics	..	1	1	..	..	2	1	..	1	..	..
Chemistry	..	5	6	..	1	12	6	3	3	..	1
Chemistry, Mineralogy and Geology	..	2	7	1	..	10	5	2	3	..	..
Geology and Mineralogy	..	3	5	..	..	8	2	2	4	..	..
Household Economics	..	16	16	1	..	33	24	2	7	1	2
Physiology and Biochemistry	..	1	1	..	..	2	2	..	..	1	..
Commerce and Finance	..	22	13	12	1	48	34	2	12	..	3
Occasional Students	5	3	..	..	..	8	6	2	..	..	..
Registered twice	..	..	1	..	..	1	1	..	..	..	..
Totals	5	332	243	119	93	792	591	101	100	21	28

Third Year

Course	University of Toronto	Univ. Coll.	Vic. Coll.	Trin. Coll.	St. M. Coll.	TOTALS	Passed	Conditioned	Failed	Aegrotat	Debarred
Pass	..	100	92	36	75	303	236	46	21	..	..
Supplementals	..	6	8	4	..	18	12	6	..	..	..
General	..	7	16	5	3	31	28	..	3	..	..
Classics	..	6	1	..	..	7	6	..	1	1	..
Latin (French or Greek Option), Div. I	..	1	3	1	2	7	7	..	..	..	..
Modern Languages	..	15	16	8	4	43	42	1	..	..	..
Oriental Languages	..	2	..	..	..	2	1	1	..	..	..
English and History	..	6	12	3	4	25	24	..	1	..	..
Law	..	23	2	3	..	28	25	2	1	..	..
Modern History	..	4	2	4	..	10	10	..	..	..	..
Philosophy	..	1	4	1	8	14	10	3	1	..	..
Philosophy (English or History Option)	..	3	5	4	7	19	19	..	..	..	..
Political Science and Economics	..	7	6	11	1	25	24	1	..	..	1
Psychology	..	4	5	1	..	10	7	1	2	2	..
Sociology	..	5	8	..	..	13	13	..	..	..	..
Mathematics and Physics, Div. I	..	1	3	1	..	5	..	2	3	..	..
Mathematics and Physics, Div. II	..	5	1	1	1	8	7	1	..	..	..
Mathematics and Physics, Div. III	..	1	..	..	..	1	1	..	..	..	..
Mathematics and Physics, Div. IV & V	..	6	2	1	..	9	6	1	2	..	..
Physics and Chemistry	..	3	..	..	..	3	3	..	..	..	1
Physics and Geology	..	1	..	..	..	1	1	..	..	..	1
Biological and Medical Sciences	..	4	6	1	1	12	11	..	1	..	..
Biology	..	2	1	2	..	5	5	..	..	..	..
Chemistry	..	4	1	2	..	7	6	1	..	..	..
Chemistry, Mineralogy and Geology, Div. II	..	3	2	1	..	6	5	1	..	..	..
Geology and Mineralogy	..	2	2	..	..	4	3	1	..	..	1
Household Economics	..	15	13	2	..	30	21	6	3	1	1
Physics	..	2	1	..	1	4	2	2	..	..	..
Physiology and Biochemistry	..	3	1	..	..	4	4	..	..	..	..
Commerce and Finance	..	23	18	7	3	51	35	13	3	..	1
Occasional Students	2	1	..	..	..	3	3	..	..	..	..
Totals	2	266	231	99	110	708	577	89	42	4	6

Fourth Year

Course	University of Toronto	Univ. Coll.	Vic. Coll.	Trin. Coll.	St. M. Coll.	TOTALS	Passed	Conditioned	Failed	Aegrotat	Degree without Honours
General	..	5	11	2	..	18	17	..	1	..	..
Classics	..	2	4	5	1	12	12	..	..	..	1
Latin (French or Greek Option), Div. I	..	..	..	2	1	3	3	..	..	..	..
Latin (French or Greek Option), Div. II	..	1	3	..	..	4	4	..	..	..	..
Modern Languages	..	22	17	1	4	44	44	..	..	..	1
Oriental Languages	..	3	..	..	..	3	3	..	..	..	..
English and History	..	9	10	3	2	24	24	..	..	..	1
Law	..	17	6	4	1	28	28	..	..	..	2
Modern History	..	1	3	1	..	5	5	..	..	..	..
Philosophy	..	2	1	..	4	7	7	..	..	..	..
Philosophy (English or History Option)	..	4	10	2	2	18	17	1	..	..	1
Political Science and Economics	..	17	4	6	1	28	28	..	..	1	1
Psychology	..	3	4	1	..	8	8	..	..	1	..
Sociology	..	5	8	..	..	13	13	..	..	..	..
Mathematics and Physics, Div. I	..	4	2	1	1	8	8	..	..	..	..
Mathematics and Physics, Div. II	..	3	2	..	..	5	5	..	..	..	..
Mathematics and Physics, Div. III	..	1	..	..	..	1	1	..	..	..	..
Mathematics and Physics, Div. IV	..	1	1	1	..	3	3	..	..	..	..
Mathematics and Physics, Div. V	..	..	1	..	..	1	1	..	..	..	..
Physics and Chemistry	..	..	1	2	..	3	3	..	..	..	..
Biological and Medical Sciences	..	9	3	2	2	16	16	..	..	1	3
Biology	..	1	1	..	..	2	2	..	..	..	..
Chemistry	..	3	5	2	..	10	9	..	1	..	..
Chemistry, Mineralogy and Geology, Div. I	..	..	..	1	..	1	1	..	..	..	..
Chemistry, Mineralogy and Geology, Div. II	..	2	1	1	..	4	4	..	..	..	..
Geology and Mineralogy	..	1	2	1	..	4	4	..	..	..	..
Household Economics	..	7	15	2	2	26	26	..	..	..	..
Physics	..	..	1	1	..	2	1	..	1	..	..
Physiology and Biochemistry	..	..	2	..	..	2	2	..	..	..	..
Science (General)	..	..	1	..	..	1	1	..	..	..	..
Commerce and Finance	..	20	6	2	3	31	31	..	..	..	1
Occasional Students	1	..	..	..	..	1	1	..	..	..	..
Totals	1	143	125	43	24	336	332	1	3	3	11

Pass Course for Teachers

	Passed	Conditioned	Total
August Examination	528	126	654
May Examination	313	93	406
	841	219	1,060

Faculty of Medicine

	Passed	Conditioned	Failed
First Year	68	8	64
Second Year	83	21	16
Third Year	74	44	9
Fourth Year	114	21	2
Fifth Year	116	18	1
Sixth Year	104	4	5
Candidates for Degree of B.Sc. (Med.)	6	..	..
Candidates for Diploma in Public Health	18	..	..
Totals	583	116	97

Faculty of Applied Science and Engineering

	Passed with Honours	Passed	Conditioned	Failed
First Year—				
Civil Engineering	2	10	9	8
Mining Engineering	2	26	11	8
Mechanical Engineering	5	22	14	8
Architecture	2	..	1	1
Engineering Physics	8	3	1	3
Chemical Engineering	9	17	20	20
Electrical Engineering	7	7	11	9
Metallurgical Engineering	5	5	5	3
Mining Geology	..	4	3	..
Second Year—				
Civil Engineering	2	5	5	1
Mining Engineering	10	20	10	2
Mechanical Engineering	3	8	14	5
Architecture	1	2	..	..
Engineering Physics	2	2	6	3
Chemical Engineering	10	9	25	8
Electrical Engineering	3	11	15	5
Metallurgical Engineering	4	20	5	4
Mining Geology	..	1	..	..
Third Year—				
Civil Engineering	1	7	8	3
Mining Engineering	4	15	10	1
Mechanical Engineering	4	8	5	3
Architecture	..	2	..	..
Engineering Physics	2	3	1	..
Chemical Engineering	8	26	17	4
Electrical Engineering	6	9	7	1
Metallurgical Engineering	4	4	5	1
Mining Geology	..	2	..	..
Fourth Year—				
Civil Engineering	1	3	..	..
Mining Engineering	7	18	7	..
Mechanical Engineering	4	11	9	..
Architecture	3	3	..	..
Engineering Physics	2	2	2	..
Chemical Engineering	14	23	3	..
Electrical Engineering	5	13	4	1
Metallurgical Engineering	1	11	..	..
Fifth Year—				
Architecture	3	5	1	..
Totals	144	337	234	102

Faculty of Household Science

	Passed	Conditioned	Failed
First Year	2	1	2
Second Year	2	..	3
Third Year	12	5	5
Fourth Year	3	1	..
Occasional Student	1	..	..
Supplementals	1	1	..
Totals	21	8	10

Ontario College of Education

	Passed	Failed
*High School Assistants' Course	252	..
Specialists' Courses	117	..
First Class Public School Course	36	..
Elementary Art Course	22	..
Elementary Commercial Course (passed in part)	29	..
Elementary Home Economics	18	..
Elementary Music Course	36	..
Elementary Physical Education Course	52	..
Elementary Shop Work	7	..
Intermediate Art Course	5	..
Intermediate Home Economics	21	..
Intermediate Music Course	36	..
Librarians' Course—		
Candidates for Degree of B.L.S.	50	..
Candidates for Diploma	8	..
Bachelor of Pedagogy Course—		
Candidates for Degree of B.Paed.	27	..
Passed in part	75	..
Number who failed in whole or part	..	158
Totals	791	158

*Many of these are included among those who passed or failed in the other courses in this list.

Faculty of Forestry

	Passed	Conditioned	Deferred	Failed
First Year	5	..	..	3
Second Year	9	..	1	2
Third Year	4	..	1	..
Fourth Year	6	..	..	..
Totals	24	..	2	5

Faculty of Music

	Passed	Conditioned	Failed
First Year	6	3	..
Second Year	12	9	3
Third Year	10	7	7
Totals	28	19	10

Faculty of Dentistry

	Passed	Conditioned	Failed
First Year	22	9	..
Second Year	38	11	..
Third Year	25	13	1
Fourth Year	32	4	..
Fifth Year	31	2	1
Dental Nurses	18	1	..
Totals	166	40	2

Departments

The numbers examined in the different departments of the University, including those persons granted standing for military service, were as follows:

Arts:		
Fourth Year	336	
Third Year	708	
Second Year	792	
First Year	959	
Pass Course for Teachers	1,060	
Graduates (Specialist Standing)	54	
		3,909
Medicine:		
Sixth Year	113	
Fifth Year	135	
Fourth Year	137	
Third Year	127	
Second Year	120	
First Year	140	
Candidates for Degree of B.Sc. (Med.)	6	
Candidates for Diploma in Public Health	18	
		796
Applied Science and Engineering:		
Fifth Year	8	
Fourth Year	147	
Third Year	171	
Second Year	220	
First Year	269	
		815
Household Science		38
Education		628
Forestry		31
Music		57
Graduate Studies		500
Dentistry		208
Social Science		61
School of Nursing		106
Physical Education for Women		24
University Extension:		
Occupational Therapy		40
Physiotherapy		34
Law		7
Pharmacy		248
Agriculture		117
Veterinary Science		54
Local Examinations in Music		13,482

(*i*) Admission to Degrees:

	Men	Women	Total
LL.D. (Honorary)	2	...	2
Ph.D	30	5	35
M.A	83	37	120
M.S	3	...	3
M.A.Sc	5	...	5
C.E	1	...	1
E.E	1	...	1
D.Paed	1	...	1
M.S.A	9	...	9
B.A	326	296	622
B.Com	30	...	30
M.D	121	10	131
B.Sc. (Med.)	6	...	6
B.A.Sc	164	...	164
B.Arch	9	2	11
B.H.Sc	...	16	16
B.Paed	25	2	27
B.L.S	1	49	50
B.Sc.F	6	...	6
Mus. Bac	3	6	9
D.D.S	30	1	31
D.Sc. (Dent,)	3	...	3
LL.B	1	...	1
B.S.A	105	1	106
B.V.Sc	51	1	52
D.V.Sc	1	...	1
Phm.B	85	6	91
Totals	1,102	432	1,534

(*j*) Admission to Diplomas and Certificates

	Men	Women	Total
Dental Nursing	..	21	21
Librarianship	..	8	8
Occupational Therapy	..	16	16
Physical Education	..	5	5
Physiotherapy	..	15	15
Psychiatry	9	..	9
Public Health	17	..	17
Public Health Nursing	..	101	101
Radiology	1	..	1
Social Science	8	17	25
Totals	35	183	218

(*k*) Geographical Distribution of Students:

FACULTY OF ARTS

	University of Toronto	University College	Victoria College	Trinity College	St. Michael's College	Totals
Ontario: (1) Province	564	436	349	126	98	1,573
(2) Toronto	642	606	485	224	148	2,105
Nova Scotia	7	2	1	..	..	10
New Brunswick	1	1	1	..	..	3
Prince Edward Island	..	..	..	..	..	..
Quebec	3	5	5	1	1	15
Manitoba	9	4	1	1	..	15
Saskatchewan	7	14	8	1	..	30
Alberta	8	13	2	1	6	30
British Columbia	7	5	2	3	3	20
United States	1	14	3	2	112	132
Elsewhere	..	12	12	4	2	30
Totals	1,249	1,112	869	363	370	3,963

THE UNIVERSITY

	Faculty of Arts	Faculty of Medicine	Faculty of Applied Science and Engineering	Faculty of Household Science	Ontario College of Education	Faculty of Forestry	Faculty of Music	School of Graduate Studies	Faculty of Dentistry	Department of Social Science	School of Nursing	Physical Education for Women	Occupational Therapy	Physiotherapy	Registered Twice	TOTALS
Ontario:																
(1) Province	1,573	296	328	20	461	13	20	162	90	15	248	4	24	11	14	3,251
(2) Toronto	2,105	459	466	15	189	13	18	259	72	20	160	19	10	12	31	3,786
Nova Scotia	10	2	1	..	11	..	..	17	..	3	6	..	1	..	..	51
New Brunswick	3	6	..	..	4	..	..	14	1	1	6	..	..	..	1	34
Prince Edward Island	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	3
Quebec	15	8	3	..	3	3	4	6	1	1	5	..	2	..	1	50
Manitoba	15	4	7	..	6	1	1	28	8	9	8	..	1	3	..	91
Saskatchewan	30	25	9	2	14	1	..	23	22	7	17	..	1	7	..	158
Alberta	30	9	8	1	3	..	..	11	1	2	3	..	..	1	1	68
British Columbia	20	19	3	3	13	..	3	12	2	4	2	1	1	..	..	83
United States	132	4	5	..	..	..	3	32	6	..	2	..	..	..	..	184
Elsewhere	30	9	3	..	5	..	..	19	9	1	9	..	..	..	3	82
Totals	3,963	843	833	41	709	31	49	583	212	64	466	24	40	34	51	7,841

THE PROVINCE OF ONTARIO

	Faculty of Arts	Faculty of Medicine	Faculty of Applied Science and Engineering	Faculty of Household Science	Ontario College of Education	Faculty of Forestry	Faculty of Music	School of Graduate Studies	Faculty of Dentistry	Department of Social Science	School of Nursing	Physical Education for Women	Occupational Therapy	Physiotherapy	Registered Twice	TOTALS
Algoma	15	10	5	..	6	..	2	..	2	..	2	..	..	..	..	42
Brant	33	10	9	1	6	1	1	7	..	1	7	..	1	1	1	77
Bruce	27	3	3	..	6	..	..	1	5	..	2	..	1	..	..	48
Carleton	79	12	7	1	29	..	1	10	6	..	16	2	..	..	4	159
Cochrane	19	3	8	..	1	..	..	..	2	..	..	..	..	..	..	33
Dufferin	22	1	2	..	4	..	1	1	..	..	1	..	..	..	..	32
Dundas	3	..	4	..	5	..	..	..	..	..	..	..	..	..	..	12
Durham	27	2	1	..	5	..	..	1	1	..	2	..	2	..	..	41
Elgin	11	1	4	1	11	..	..	2	3	..	3	..	..	..	..	36
Essex	46	10	14	..	29	..	1	6	4	..	6	..	1	..	..	117
Frontenac	7	1	..	..	5	..	..	1	1	..	4	..	1	..	..	20
Glengarry	2	1	1	..	3	..	..	..	1	1	..	..	..	..	..	9
Grenville	4	1	..	1	3	..	..	..	..	..	1	..	..	..	..	10
Grey	45	4	10	..	13	2	..	4	2	..	4	..	..	..	..	84
Haldimand	13	1	..	..	5	..	..	5	..	..	1	..	1	1	..	27
Haliburton	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	3
Halton	28	4	10	..	8	..	..	1	2	..	9	..	3	..	..	65
Hastings	23	2	2	..	7	1	..	..	3	..	6	..	..	..	..	44
Huron	38	5	1	..	13	1	..	4	..	..	6	..	..	..	..	68
Kenora	2	3	1	..	1	..	..	..	1	..	..	..	..	..	1	7
Kent	14	9	11	1	9	1	1	3	3	1	6	..	..	..	1	58
Lambton	27	6	7	2	8	..	..	1	4	..	2	..	..	..	..	57
Lanark	10	1	4	..	4	..	..	2	..	1	1	..	1	..	..	24
Leeds	11	2	..	..	7	..	..	1	2	..	3	..	..	..	..	26
Lennox & Addington	4	..	..	..	3	..	..	..	..	..	2	..	..	..	..	9
Lincoln	44	10	20	..	6	..	..	6	4	..	13	..	2	1	..	106
Manitoulin	3	..	..	..	..	..	..	..	..	..	..	1	..	..	..	4
Middlesex	19	2	5	..	34	..	1	9	1	..	13	..	..	..	1	83
Muskoka	18	3	2	2	4	..	2	1	..	..	4	..	..	..	..	36
Nipissing	19	17	8	..	8	..	1	1	4	..	5	..	1	2	..	66
Norfolk	11	4	4	1	2	..	..	1	4	..	1	..	1	..	..	29
Northumberland	19	3	5	..	5	..	1	1	3	..	1	..	..	..	..	38
Ontario	51	12	5	..	9	..	..	4	3	2	12	..	..	..	..	98
Oxford	23	9	6	..	6	..	1	4	1	..	6	..	..	1	..	57
Parry Sound	16	..	2	..	4	..	..	1	2	..	3	..	1	..	..	29
Peel	68	5	14	1	3	..	..	3	..	2	9	..	..	..	..	105
Perth	45	8	5	..	14	..	..	1	1	..	4	..	1	1	..	80
Peterborough	27	5	4	..	7	..	..	2	1	..	10	..	..	1	..	57
Prescott	2	1	..	..	5	..	..	..	..	..	..	1	..	..	1	8
Prince Edward	10	1	1	..	4	..	..	..	1	..	1	..	..	..	..	18
Rainy River	7	5	..	..	1	..	..	1	..	..	..	..	..	..	..	14
Renfrew	18	1	1	..	6	..	..	2	..	..	4	..	1	..	..	33
Russell	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	2
Simcoe	96	10	17	2	8	1	1	7	7	..	9	..	2	2	2	160
Stormont	7	1	1	..	2	..	..	..	..	..	2	..	..	..	..	13
Sudbury	17	..	2	..	1	..	..	..	..	2	..	..	..	..	..	22
Thunder Bay	43	3	7	..	5	..	1	4	3	..	3	..	..	..	..	69
Timiskaming	20	7	6	2	6	1	..	1	..	..	8	..	..	..	..	51
Victoria	32	4	2	..	4	1	..	..	1	..	..	..	..	..	..	44
Waterloo	48	14	12	3	19	..	..	2	3	..	7	..	..	..	..	108
Welland	45	15	20	..	13	1	2	6	2	1	8	..	..	..	..	113
Wellington	58	14	11	..	10	..	..	20	..	2	8	..	..	..	..	123
Wentworth	75	20	24	2	55	..	2	24	5	..	13	..	2	1	2	221
York	221	29	40	..	27	3	1	11	2	1	20	..	2	..	1	356
Toronto	2,105	459	466	15	189	13	18	259	72	20	160	19	10	12	31	3,786
Totals	3,678	755	794	35	650	26	38	421	162	35	408	23	34	23	45	7,037

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